Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

JULY 12, 1948
VOLUME 37, No. 14

AMERICAN DYESTUFF REPORTER

OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

THE BEST for
Cotton shirtings...
VAT COLORS

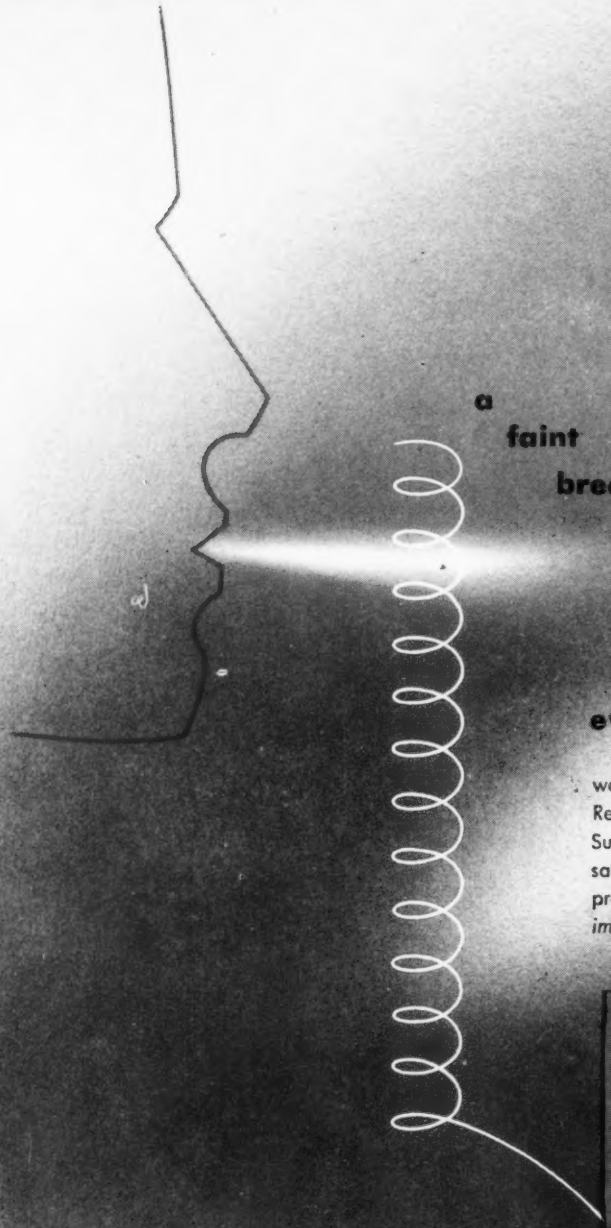
For the best in all-round fastness properties —use vat colors. Du Pont vats are suitable for all types of application. They're available in a wide range of shades for printing, duplex printing and overprinting—and for dyeing. They have the same fastness whether applied to yarn or piece goods.

Du Pont offers Ponsol*—anthraquinone-type dyes—and Leucosol*—specially prepared anthraquinone types for printing. For all cotton shirtings, look to Du Pont vat colors. Our Technical Staff will assist in solving your problems.
E. I. du Pont de Nemours & Co. (Inc.),
Dyestuffs Div., Wilmington 98, Del.

*REG. U. S. PAT. OFF.

Du Pont Dyestuffs
DU PONT
REG. U.S. PAT. OFF.

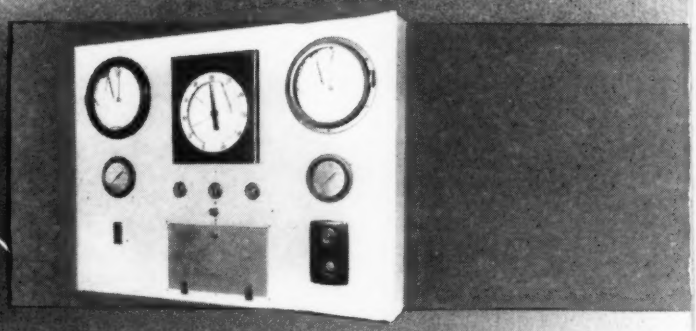
BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY



a
faint
breath...

even for 1/100th of a second...

would register a marked variation on our Electronic Recording Thermometers because they are so sensitive. Such precise processing equipment at Althouse safeguards every operation in our own exclusive processes, thereby eliminating "variations and *keeping impurities* out of finished dyestuffs."



Practical production with equipment "throughout the plant" just as sensitive as equipment "in the laboratory" results in PRECISION Dye-Making.

ALTHOUSE
Chemical Company, Inc.
READING · PA.

Pace-setter in precision dye-making

AMANTHRENE* VAT COLORS
provide the answer to the demand for
better color fastness in textiles

Amanthrene

BROWN RRD

in paste or
double powder form

Advantages of this Vat Brown include a full, chocolate shade, printing excellence and all round good fastness as applied to cotton and rayon . . . Primarily a printing color but easily adapted to the dyeing of these fibres.

A homogeneous paste or a finely divided, dispersible powder offer further advantages.

Another of the Amanthrene range of superior vat colors. For detailed information on the whole range available, as well as data regarding your own particular requirements, consult our nearest branch. A.A.P. technicians are always happy to be of service.

AMERICAN ANILINE PRODUCTS, INC., 50 Union Square, New York, N. Y. • ***Plant:*** Lock Haven, Pa.
Branches: Boston, Mass. • Providence, R. I. • Philadelphia, Pa. • Charlotte, N. C. • Chicago, Ill. • Los Angeles, Cal.
Chattanooga, Tenn. • **Dominion Anilines & Chemicals Ltd.** • Toronto, Canada • Montreal, Canada

*Reg. U. S. Pat. Off.

COCONUT FATTY ACIDS

• • • • • Trade reports all show laboratory tests of "Excellent"
• • • • • Confirmed by actual plant results. White color, fast wetting power and excellent detergency of finished products assure customer acceptance in the textile field.

A. Gross' "Special" Coconut Fatty Acids, with the major proportion of the lower acids (Caproic, Caprylic and Capric) removed, yield a product more desirable for detergent manufacturers.

RED OIL

Bland odor, low titre, low in unsaponifiables. Produced entirely from selected animal fats. Improved chemical and physical properties due to modern distillation and control.

Send for our booklet, "Fatty Acids in Modern Industry"

Manufacturers Since 1837

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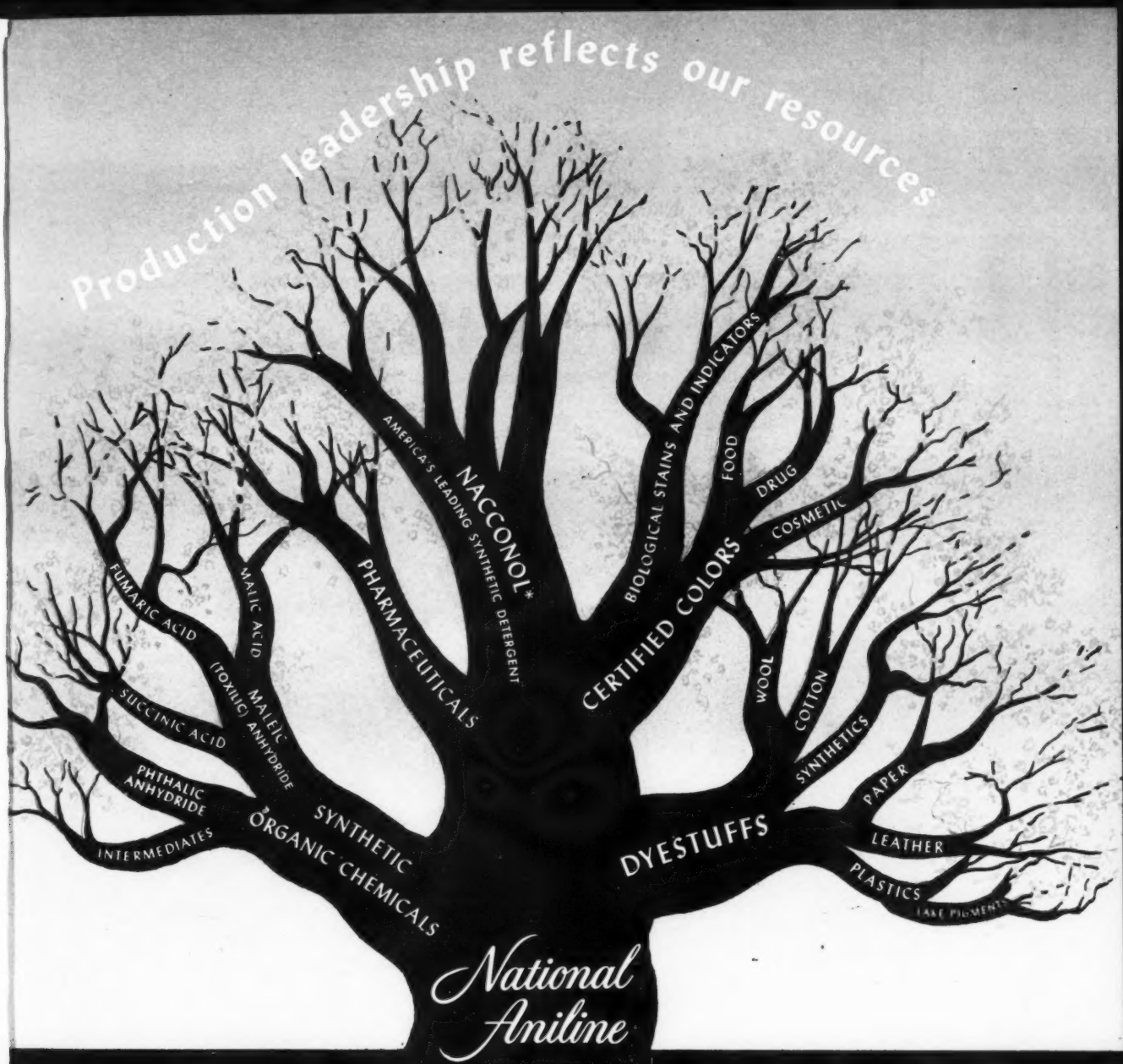

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COKE AND ITS BY-PRODUCTS

for assured delivery

SPECIFY *National Aniline* PRODUCTS

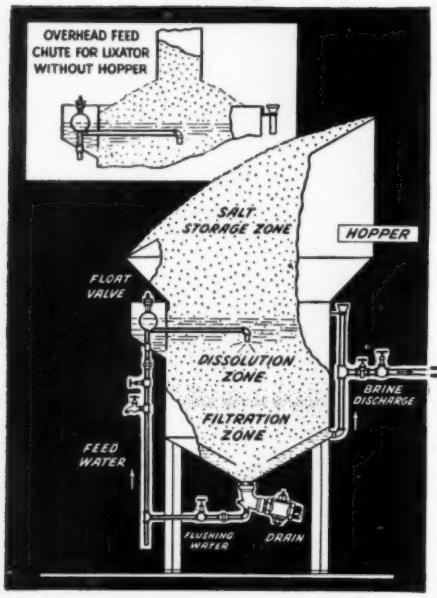
NATIONAL ANILINE DIVISION · ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N.Y.

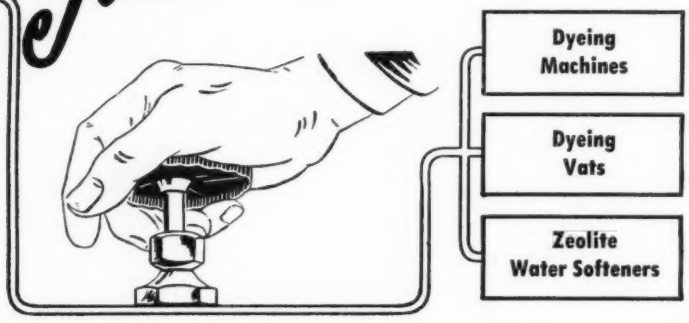
Why HAUL SALT

MEASURE SALT

STIR SALT?

just Turn it on!





HOW THE LIXATOR WORKS

In the dissolution zone—Flowing through a bed of Sterling Rock Salt which is continuously replenished by gravity feed, water dissolves salt to form 100% saturated brine. **In the filtration zone**—Through use of the self-filtration principle **originated by International,** the saturated brine is thoroughly filtered through a bed of undissolved rock salt. The rock salt itself filters the brine. Nothing else is needed.

WHAT THE LIXATOR PROVIDES

- ✓ **Chemical and bacterial purity to meet the most exacting standards for brine**
- ✓ **Unvarying salt content of 2.65 pounds per gallon of brine**
- ✓ **Crystal-clear brine**
- ✓ **Continuous supply of brine**
- ✓ **Automatic salt and water feed to Lixator**
- ✓ **Inexpensive, rapid distribution of brine to points of use by pump and piping**

YOU CAN ELIMINATE shoveling salt from storage, hauling salt around the plant, and laborious hand-stirring of salt and water . . . with the Lixate Process for Making Brine. This exclusive International development also stops waste of salt through spilling. It saves valuable time and labor, and assures accurate salt measurement.

For the Lixator *automatically* produces 100% saturated, free-flowing, crystal-clear brine which may be piped to as many points in your plant as you wish—any distance away—by gravity or pump.

You simply turn a valve for self-filtered brine that meets the most exacting chemical and bacterial standards for every brine need. Lixate brine is quickly and accurately diluted volumetrically to any desired strength.

Many Lixate users report savings of as high as 20%. Why not investigate the Lixate Process for your plant?

Completely flexible, a Lixate installation can be made to supply any needed brine requirement. No costly investment is required. The Lixator pays for itself out of savings. See how others have saved—write now for your copy of "The Lixate Process for Making Brine."

INTERNATIONAL SALT CO., INC., Dept. ADR-7, Scranton, Pa.

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The LIXATE *Process*

Reg. U. S. Pat. Off.

for making brine

INTERNATIONAL SALT COMPANY, INC.

Scranton, Pa.

ONYX IONICS

July PRINTING EDITION 1948

Wipe Out Bleeding with Onyxchlor

Onyxchlor in the last stage of your washing rinse will end migration of dyestuffs while the goods are in the wet state. Bleeding from the print to the ground is eliminated—hence clearer, brighter, better defined color effects are made possible.

Onyxchlor also aids materially in overcoming mark-off. While it is not effective in providing wash fastness, it is useful in improving fastness to cold and salt water, perspiration and hot pressing.

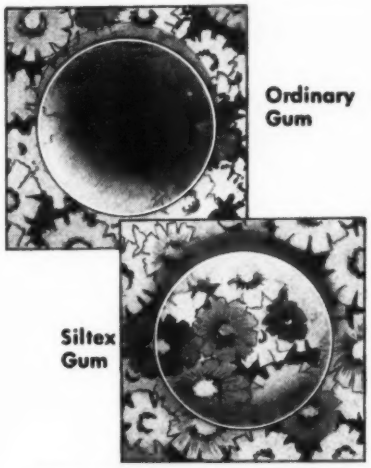
In the last wet rinse, Onyxchlor will also improve quality of printed goods by eliminating color drawing in the dryer. It has no effect on the shade or finish.

No changes in equipment or procedure are involved. Simply use Onyxchlor in the last washing rinse and process the goods as usual.

For Crystal Clarity, Sharp Definition, Perfect Penetration, Use Onyx Siltex Gums in Your Printing Operations

Onyx Siltex Gums are still the most effective printing gums on the market. They insure purer whites and clearer colors than any other gums, because they are transparent, colorless, virtually water-white.

Lime-free, Siltex Gums are ideal for any kind of printing. There's no grit to damage rolls or doctor blades. They give you perfect penetration. They mix well with other gums to make smoother pastes. They will not froth during long runs, and do not thin out, retaining their consistencies all the way.



Compare the darkening and muddying effect of ordinary printing gum on the upper watch crystal with the clarity and transparency of Siltex Gums on the lower crystal.

Four parts of Siltex Gum Super Concentrated will do the work of five parts of ordinary gum. Both Siltex Gum Super Concentrated and Siltex Gum Extra Refined are readily adaptable to vat printing. The Siltex Gums have extreme solubility. This solubility makes for better washing and easier mixing, with considerable saving in time and labor.

If you are after whiter whites and clearer, brighter colors, sharply and evenly defined, it will pay you to reinvestigate this superior printing gum.

Onyx Levelol SP Gives You Smoother Running Prints

Onyx Levelol added in small amounts to printing pastes insures greater homogeneity of the paste, reduction of foaming, improved penetration and easier washing out. It has proved to be most satisfactory in providing smoother running prints on both machine and screen applications.

NEW DEVELOPMENTS

For Further Details Write Onyx

Low Cost Print Washing with Xynol DD. Xynol DD is a new, inexpensive washing compound developed for washing printed goods. It is used in relatively small amounts for very effective washing. In continuous machines, it is ordinarily used in the next compartment after wetting out. If you are interested in low cost print washing, write for complete data on Xynol DD.

Softening Effects at the Print Wash are easy to get by adding one of the Onyxsans (depending on the hand desired) to the slop wash. A stock solution is prepared, part of which is added to the last compartment in the slop wash. The remaining stock solution is run into the wash either continuously or added after every 5 pieces of goods have been run. This is all the finishing required. The goods are then extracted, dried, framed and calendered as usual.

Whenever You Need a Hard Water Auxiliary don't forget to give Neutronyx 330 a thorough test. This non-ionic surface-active agent with detergent, emulsifying and dispersing properties is compatible with anionic and cationic materials, and disperses insoluble anionic-cationic complexes. If you have a hard water (or electrolyte) problem where an auxiliary detergent is needed, ask us for recommendations on Neutronyx 330.

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FOR YOUR INFOR M ATION

POLICE PROVE RESLOOM* K

Officers report no shrinkage

One of the most extensive field tests ever given any textile development now adds further evidence that Monsanto's Resloom effectively reduces and controls the shrinkage of woolen and worsted fabrics, *under practical wearing and washing conditions.*

The test

In this exclusive test approximately 1000 Resloom-treated wool flannel shirts were given 320 members of the Springfield police force. Officers were told to wear them and have them washed without any restrictions on washing methods, save one: Do not boil.

Four months later...

A check showed each shirt had received an average of four washes . . . up to 21 washes in some cases . . . under varied, everyday, practical washing conditions.

None of the shirts shrank out of size.

The shirts received the enthusiastic written approval of the policemen and their wives.

Police Chief Raymond P. Gallagher reported:

"I have yet to hear one word other than praise and commendation. None of the shirts showed enough shrinkage to be noticed, colors remained fast, and the shirts both before and after washing had the *feel of a high grade piece of untreated normal all-wool flannel.*"

And one year later...

Chief Gallagher again reports:

"I have conducted another survey and find that these shirts are all giving useful service with no officer reporting any unusual shrinkage . . . It would appear that these shirts will still be worn two years hence . . . they are still soft, warm and tough and after considerable washings still indicate a minimum shrinkage.

Prospects for you...

Multiply these 320 Springfield police officers by the hundreds . . . by the thousands . . . and you'll get an idea of the market waiting for washable woolens . . . in sportswear, children's wear, skirtings, blankets, play clothes.

Police Officer Arthur Murphy of Springfield, Massachusetts, announces the results of Resloom tests in this four-color full page advertisement to appear soon in Saturday Evening Post, Fortune, Time, Newsweek and Business Week . . . an example of the extensive promotion which Monsanto gives to stimulate consumer sales of washable woolens.

Only Resloom...

When you select the process to make your woolens washable, remember:

The most and the best of the washable woolen fabrics on the market today are Resloom-treated.

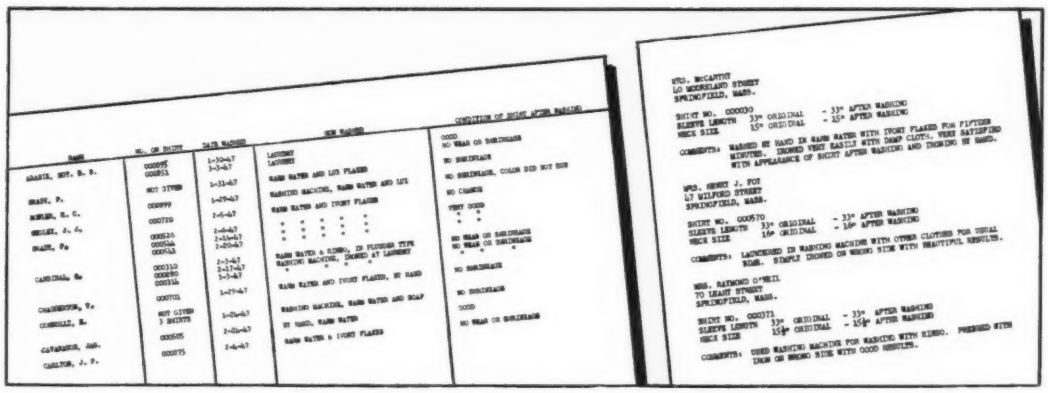
Only Resloom-treated woolens have had this extensive field test, under practical, everyday service and washing conditions, *without a single complaint on shrinkage.*

Only Resloom-treated merchandise has been on sale for more than a year *without a single complaint on shrinkage.*

Monsanto has the technical background, the proved mill and field experience, to get you started on this profitable new market now. Check the coupon at right.

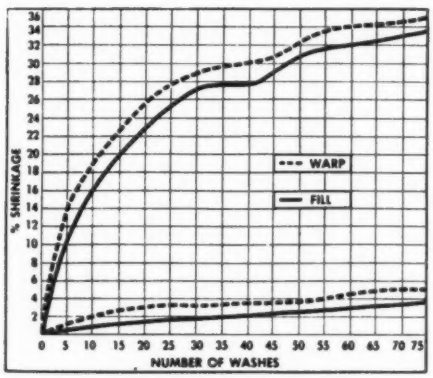
KEEPS WOOL WASHABLE!

Careful records and housewives' comments show RESLOOM'S success in field tests



Careful records were kept of each washing of each shirt . . . and the results were tabulated. At the conclusion of the test, when each shirt had received an average of four washes, housewives reported no noticeable shrinkage. And scientific checking later showed no shrinkage out of size.

Results of the tests . . . as reported in detail by the policemen's wives . . . clearly demonstrate the success of Resloom W in preventing wool shrinkage under all kinds of washing conditions in many different households. Every numbered shirt was reported on for changes in sleeve length and neck size and results were universally good.



Untreated, all-wool 9½ oz. flannel shows up to 34% shrinkage in 75 washes while Resloom-treated flannel shrinks less than 5% in 75 washes . . . far more than the average garment would receive.

Resloom control good for the life of the fabric

Objective laboratory tests are further and conclusive proof that:

RESLOOM EFFECTIVELY REDUCES AND CONTROLS SHRINKAGE OF WOOLENS AND WORSTEDS.

The average consumer woolen . . . such as a sport shirt or blanket . . . gets far less than 75 washes during its normal life. The graph at the left vividly shows that Resloom holds wool shrinkage below 5% even after 75 washes.

The fabric was washed in an automatic washing machine of the type used in commercial laundries. Cycle: two five-minute suds at 100° F with neutral soap on detergent, and four two-minute rinses.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS — PLASTICS
SERVING INDUSTRY...WHICH SERVES MANKIND

Use this coupon for full data

MONSANTO CHEMICAL COMPANY, TEXTILE CHEMICALS DEPT.
Desk No. ADT-7, 140 Federal Street, Boston 10, Mass.

Please send me information on:
Resloom W for washable wool

NAME _____ TITLE _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

IF YOU WANT

DURABLE *Softness*

Paramine TA is the modern cationic finish for acetate, viscose, cotton and mixed fibres. Mills using paramine TA for dress goods, glove fabrics, tricot and other types of knitted materials have found this finish offers added sales appeal.

Thorough penetration of Paramine TA assures a softness within the yarn itself that gives materials a full hand and desirable drape—its substantive action produces a durable, lasting finish —Application is simple.

Use Paramine TA

*Reg. U. S. Pat. Off.

WRITE FOR DETAILS OR DEMONSTRATION

Arkansas Co. INC.

Manufacturers of Industrial Chemicals for Over 40 Years

NEWARK, NEW JERSEY

Have You Tried "ELVACET" POLYVINYL ACETATE EMULSION

- **For development of semi-permanent finishes to improve hand, drape, appearance and launder resistance;**
- **As a stiffener for fabrics;**
- **As a preventive for edge rolling, warp-filling slippage and raveling;**
- **As a binder in back-filling compositions?**

Try it! You'll find this versatile resin may solve many of your finishing problems. With it, you can get practically any kind of a hand or drape. And at low cost—for it takes very little "Elvacet" to get required effects.

"Elvacet" can be applied with conventional finishing equipment. It can be used on a wide variety of non-woven, woven and knitted fabrics made from filament and staple yarns of all types and all constructions. Typical classes of goods which can be treated with "Elvacet" include: woven and knitted piece goods, toweling, pile fabrics, drapery fabrics, tricot knits for inner and outer wear, hosiery, etc.

We'll be pleased to tell you more about "Elvacet," how it can be used in economical finish formulas. Just write or call our nearest district office.

ADVANTAGES OF "ELVACET" POLYVINYL ACETATE EMULSION

Completely dispersed in water to give emulsion which contains resin particles of uniformly very small size.

Highly concentrated, with no modifiers. Easily diluted with water to requirements.

Highly compatible with starches, dextrins, gums, waxes and synthetic resins commonly used in semi-permanent and permanent finishes; also with ester-type plasticizers which are sometimes needed with "Elvacet" to get effects desired.

Highly stable—very little settling over fairly long periods or when highly diluted for normal use.

E. I. DU PONT DE NEMOURS & CO. (INC.)
ELECTROCHEMICALS DEPARTMENT
WILMINGTON 98, DELAWARE

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DU PONT

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

TERGITOL *wetting agents are*

SPECIFIC

If your textile operation is one of the following, a specific TERGITOL wetting agent can save you money and processing time:

WOOL CARBONIZING . . . remarkable wetting action and complete stability.

DYEING . . . rapid and level dyeings with all types of colors.

MERCERIZING . . . greatly increased speed, and chemical stability.

SHRINKING . . . instant wetting for caustic shrinking of knitted goods.

BLEACHING . . . no preliminary boil-out needed for mercerized and grey cotton stocks.

TWIST SETTING . . . increased speed of wetting.

TERGITOL 7 . . . for dilute aqueous solutions containing less than 1 per cent dissolved solids.

TERGITOL P-28 . . . for water solutions containing 2 to 5 per cent inorganic salts or 1 to 2 per cent alkalies.

TERGITOL 4 . . . for solutions containing from 1 to 10 per cent acids or salts, or 2 to 5 per cent alkalies.

TERGITOL 08 . . . for solutions containing 10 to 20 per cent acids, alkalies, or salts.

TERGITOL EH . . . for solutions containing 20 to 30 per cent dissolved inorganic acid, base, or salt.

CARBIDE and CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities

In Canada:

Carbide and Carbon Chemicals, Limited, Toronto

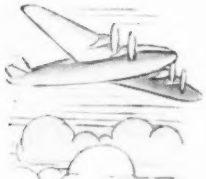
TERGITOL is a registered trade-mark of C & CCC.

The five TERGITOL wetting agents are powerful, fast-acting textile penetrants. And they are chemically stable under severe operating conditions. These easy-to-use liquids are inexpensive—a little goes a long way. They are available from local warehouse stocks. For help in choosing the most suitable TERGITOL wetting agent for your application call or write our nearest office. When writing, please address Dept. A-7.

general dyestuff corporation

despite the effects of a war-time economy and the scarcity of construction materials, equipment and raw materials, the general dyestuff corporation delivered to the american consumer more than twice as many pounds of dyestuff in 1947 as before the war.

Fatty Acids?...Hardesty, of course!



Every day it becomes more *a matter of course* to phone Hardesty for fatty acid requirements. Manufacturers of a diversified list of products have the Hardesty Habit . . . a habit which has been formed because of Hardesty's habit of providing quality chemicals—*when* you want them, *how* you want them.

Some habits—the shoe you put on first in the morning, the way you button your coat — are meaningless, but the Hardesty Habit means quick deliveries *and* uniformity of products.

Where it's a matter of assured shipments of quality fatty acids, it's a matter of course to contact Hardesty.

Of course . . . it's the W. C. Hardesty Company, 41 East 42nd Street, New York 17. At the other end of your telephone wire: MUrray Hill 2-1920.

Red Oil Glycerine Stearic Acid
White Oleine Stearine Pitch Hydrogenated Fatty Acids Animal and Vegetable Distilled Fatty Acids.

HARDESTY PRODUCTS ARE INDUSTRY'S KEYSTONE

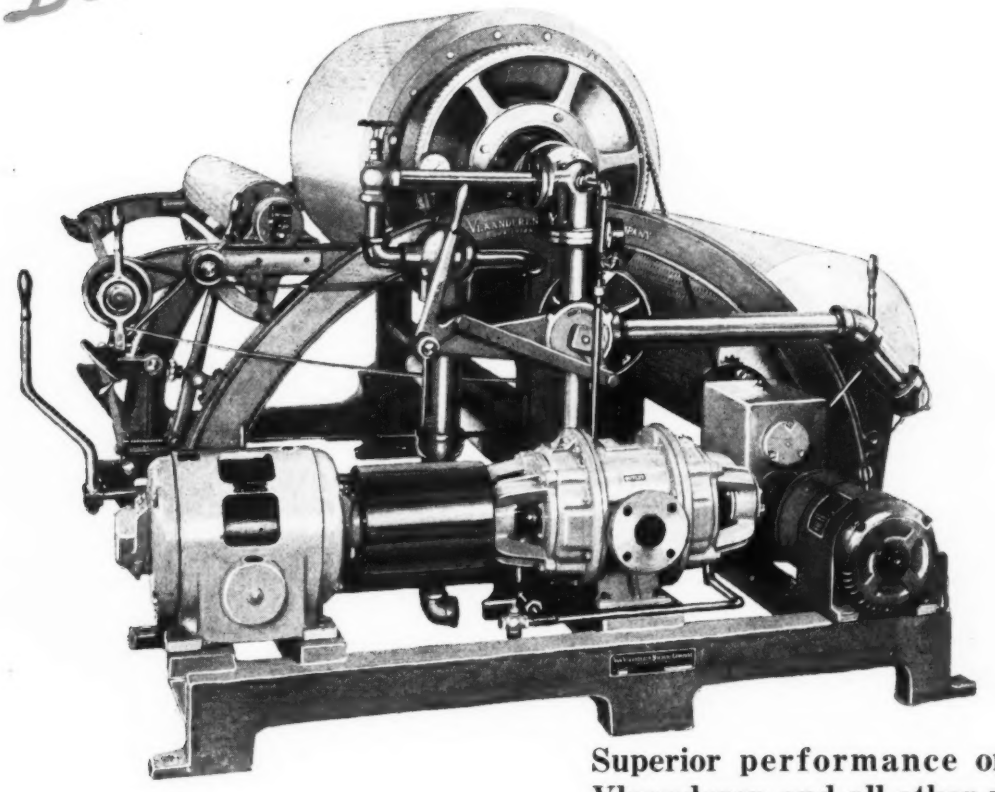
W. C. Hardesty Company

41 EAST 42nd ST., NEW YORK 17

FACTORIES: DOVER, OHIO
LOS ANGELES, CALIF. • TORONTO, CAN.

BETTER BLANKETS for DECATERS

Immediate Delivery



Superior performance on Van Vlaanderen and all other makes.

You can now get these superior double sateen face decater blankets without waiting months for delivery. We now stock them in 52, 56 and 72 inch widths and in lengths from 400 to 1000 yards.

This is the new improved blanket developed over a period of many years from our long experience in manufacturing decating machines. It gives longer service—up to 20% more—and better quality work, both on Van Vlaanderen and on other decating machines. Now being used on hundreds of machines. The blanket you use can affect the production of your decating machine—its porosity is important. We periodically test the porosity of Van Vlaanderen Blankets so you will get better production.

Send for a sample of this blanket. You will recognize its quality and performance. Telephone, telegraph, or write now.

VAN VLAANDEREN MACHINE COMPANY

370 Straight St., Paterson 3, N. J. • Cable Address: VLAANDEREN, PATERSONNJ, U.S.A.

World's largest manufacturer of machines for processing modern fabrics

The Heavenly Look in Stocking Fabrics

Smooth as a cloud . . . as new as tomorrow . . . that's the appearance of stocking fabrics treated with Filaseal Resin Finishes. For Filaseal causes stockings to return to their original shape after hours of creasing and handling at the hosiery counter. Gives stocking fabrics the added body and snag-resistance necessary for high-speed boarding, examining, pairing, folding and packaging. Write for full details.

AMALGAMATED CHEMICAL CORP.
Phila. 34, Pa. : : Southern Div.: R. A. Bruce, *V. P. & Mgr.*, P.O. Box 35, Greensboro, N. C.

Filaseal

— to cut down snags and pulls

Stockings that look "handled" stay on the hosiery counter until all the "fresh" stockings are sold.

Stockings finished with Filaseal sell faster because they look better . . . stay smooth and fresh.

The products of Amalgamated Chemical Corporation include Hosiery Finishes, Wetting Agents, Penetrants, Softeners, Detergents, Soaps, Water Repellent Finishes.

FOR THE *Perfect Note* IN COLOR HARMONY

Clear, crisp prints . . . bright gay pastels . . . vibrant hues that strike the perfect note in fashion's harmony of color — these are the printing results assured with Keltex, the modern algin thickening agent.

Keltex insures true, full color values — prevents pigment migration — makes certain of exact printing paste viscosity and perfect penetration. It is equally effective in both machine and screen printing, ideal for the pad pigment method of vat dyeing.

Keltex is a product of nature, rigidly processed to insure consistently uniform results. It's entirely free of impurities, easy to apply and requires only a light wash for removal. For perfect printing of prints and pastels — and with economy too — you can depend on Keltex. We will be glad to send you full information on its adaptability to your particular application. Drop us a line today.

KELTEX . . . A PRODUCT OF

KELCO COMPANY

KELTEX REFINED ALGIN PRODUCT

20 N. Wacker Drive
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31 Nassau Street
NEW YORK—5

530 W. Sixth Street
LOS ANGELES—14

Cable Address: KELCOALGIN—New York

Liquid
HYDRALDEHYDE
The Name to Remember When Buying Stripping Agents

Outselling all others since its origin twenty years ago—it is *today* the woolen industry's *safe* stripper. Our constant efforts to eliminate free zinc in *liquid* HYDRALDEHYDE through modern manufacturing methods assure stronger fibres in reworked wool and piece goods.

Test *liquid* HYDRALDEHYDE against any other stripping agent offered—either powder or liquid—for a true comparison of the fibre's breaking strength.

WATSON-PARK COMPANY

261 FRANKLIN STREET BOSTON, MASS.

FACTORY · LOWELL JUNCTION · MASS.

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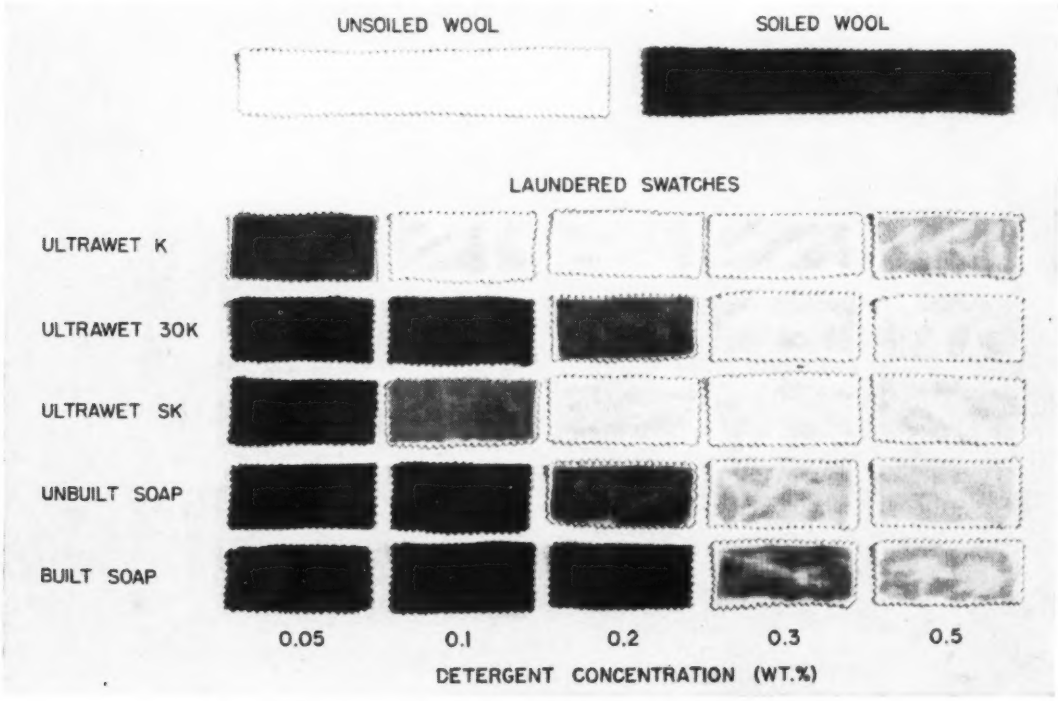

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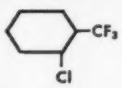

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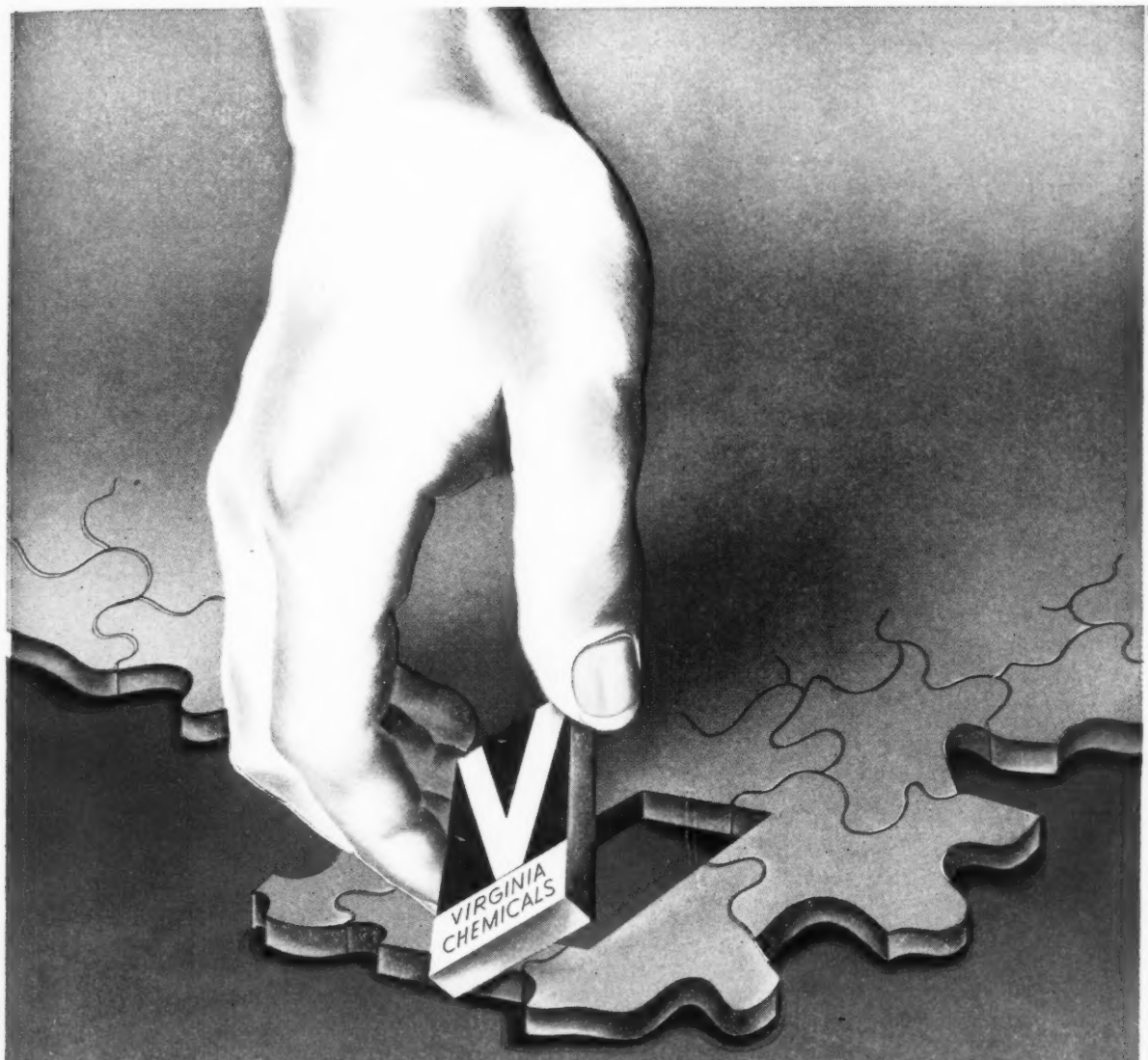

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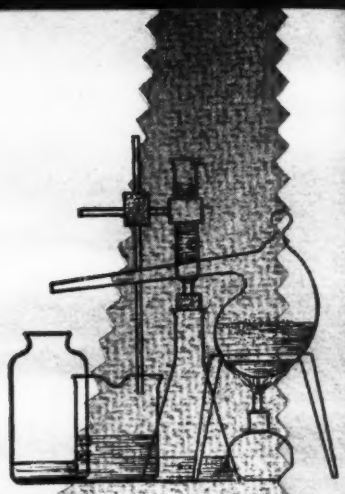

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VOLUME 37 JULY 12, 1948 NUMBER 14

Determination of the Fineness of Wool Samples by Sedimentation

GEORGE C. LeCOMPTE
Livestock Branch, U. S. Dept. of Agriculture

Introduction

DURING the past five or six years it occurred to the writer several times that it should be possible to get some idea of the fineness of a wool by measuring the rate at which short sections of the wool would settle in an appropriate solvent. The idea of using the rate of sedimentation as a measure of fineness is not new. It is commonly used in tests on soils and is also used in the testing of portland cement to determine how finely the cement has been ground. A few short tests were run to see whether a similar sedimentation analysis might not be useful in determining the fineness of samples of wool. These tests are reported in this paper.

Experimental Details

Sedimentation tubes were built according to figure 1. They were built up of strips of crystal clear, water white Plexiglass (methyl methacrylate resin). This material was obtained ⅛ inch thick and was sawed into strips 1 inch and ¾ inch in width. These were cemented together to form square tubes of ¾ inch width, internal dimensions. The strips were cemented by holding them closely together while an appropriate solvent was painted along the angle of the junctures. The top part of the square tube was designed as a mixing chamber in which the short wool sections could be thoroughly mixed and suspended within the solvent just prior to the actual sedimentation process.

Preliminary experiments with petroleum ether and alcohol showed that wool fibers would settle in these solvents perhaps too rapidly. Far greater difficulties with these solvents were that they were so volatile, had such low specific heats, and such high temperature coefficients of expansion that very slight alterations in temperature, whether due to temperature changes in the room, to contact with the hands of the operator, or to the cooling effect of evaporation, would cause very troublesome thermal diffusion currents which could actually be observed rapidly elevating some short sections into higher portions of the settling tube while in other portions the short sections would be settling perhaps only twice as rapidly.

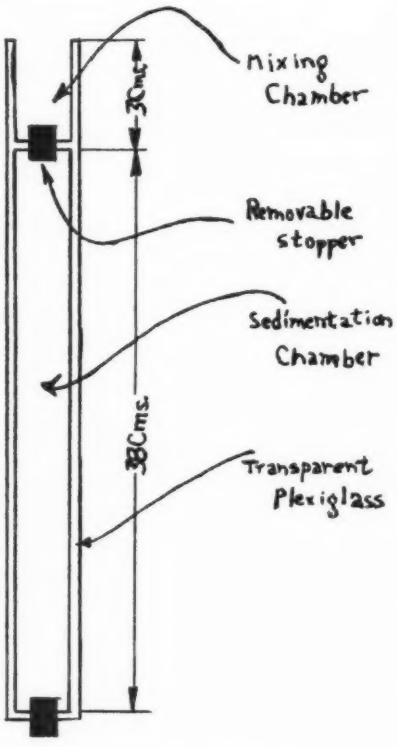

Fig. 1—Sedimentation Tube

Carbon tetrachloride was tried as a solvent but its density was greater than that of the wool fibers so that they floated upward. It was felt that this would be a drawback and no further experiments were run with this solvent.

It was thought that ethylene glycol might constitute a suitable medium for sedimentation and some experiments were run with it. Considerable difficulty was experienced in getting the wool fibers to wet out in ethylene glycol. When finally wet out, it was found that it took one to two minutes to settle as much as one mm. and it was decided that ethylene glycol was too viscous a medium. The same was true of diethylene glycol and glycerine.

Experiments were then run using water as a sedimentation medium. Water produced such difficulty in getting the fibers wet out that it was necessary to use instead of water a 0.01 per cent solution of N-100, a synthetic detergent and wetting agent. Short sections of wool fibers would wet out fairly well in this solution and also would tend to deflocculate, clumps of fibers tending to break up and suspend uniformly within the aqueous solution. Of course, the use of the N-100 wetting agent carried with it its own brand of trouble, a tendency to form bubbles and froth, and this in turn required precautions to avoid production of bubbles which would interfere with the sedimentation of the wool fibers.

After having decided upon a 0.01 per cent solution of N-100 in water as the best solvent for the purpose, the actual procedure of sedimentation was worked out as follows. About 40,000 to 50,000 wool fibers were cut in short sections of a length

averaging about 250 microns. Each sedimentation tube was filled with 0.01 per cent N-100 at room temperature (34° C.) to about 2 mm. above the top of the floor of the mixing compartment. Bubbles adherent to the inside of the tube were worked up and out by shaking and striking the tube. Bubbles at the top of the sedimentation column were worked out by tilting the tube from one side to another. Every effort was made to keep the temperature of the liquid within the tube the same as the room temperature. The lower parts of the tube were never held in the hands. After all bubbles had been worked out, the top of the sedimentation column was tightly corked. All bubbles were removed from within the mixing chamber by means of a medicine dropper. A slurry of about 40,000 to 50,000 cut fibers was made in approximately 10 mls. of 0.01 per cent N-100 by mixing vigorously in a 50 ml. beaker. This slurry was then poured into the top of the mixing compartment. The slurry was kept in suspension by gentle mixing. At the proper time, the mixing was stopped, a timer was set off, the cork at the top of the square tube was pulled out and the short fibers suspended in the mixing compartment were allowed to fall into the sedimentation compartment for approximately 10 seconds. At the end of 10 seconds, the cork was placed into the top of the settling tube. The sedimentation was allowed to proceed for 74 seconds. (This 74-second sedimentation period had been decided upon because it represented the shortest time required for the first single fibers of the coarsest wools in these tests to settle to the bottoom of the sedimentation tubes. Having decided upon 74 seconds as the sedimentation time for the coarsest wool in these tests, 74 seconds was kept as the standard sedimentation time for all samples.)

Sedimentation tests were run upon short sections of 80's, 64's, 46's, and 36's tops. As soon as the standard 74-second sedimentation period had elapsed, the sedimentation tube was laid on its side. The fibers then simply settled to the side of the tube to form an array which was permanent as long as the tube was kept in a horizontal position.

It appeared possible to make some qualitative judgments by eye as to the distribution of the fibers within the different samples but a quantitative record was desired. Although it developed that there were from 6,800 to 15,800 fibers in each of the four tests, in no case did there appear to be a density of fibers which would make a clear impression by usual photographic methods upon a photographic plate. Accordingly, it was decided to make a permanent record of the distribution of fibers in the sedimentation tube by counting the individual fibers at the various depths along the tube. This was done. The counting was aided by a simple lens with a magnifying power of about 5X. From 6,848 fibers on the smallest test up to 15,855 fibers on the most drawn out test were counted. The job was merely to count, not to measure but it was arduous and tiresome. The results are recorded in Table I and in Figure 2.

It was thought that it might be of some interest to compare the distributions as obtained by sedimentation with the distributions of samples of the same grades of wool top as obtained by microscopic measurements. The distribution by microscopic measurements is shown in figure 3.

Table I. Numbers and Percentages of Fibers in Different Grades of Wool Top Showing Various Sedimentation Drops

	80's Top			64's Top			46's Top			36's Top		
Cms. Drop	No. of Fibers	% of Fibers		No. of Fibers	% of Fibers		No. of Fibers	% of Fibers		No. of Fibers	% of Fibers	
1	17	0.2		174	1.1		32	0.4		11	0.1	
2	139	2.0		352	2.2		59	0.7		5	0.1	
3	370	5.4		552	3.5		83	1.0		15	0.2	
4	500	7.3		781	4.9		135	1.7		34	0.4	
5	609	8.9		783	4.9		182	2.3		57	0.7	
6	745	10.9		717	4.5		202	2.5		92	1.1	
7	682	10.0		483	3.0		323	4.1		150	1.9	
8	620	9.1		662	4.2		383	4.8		133	1.7	
9	571	9.1		976	6.2		361	4.5		143	1.8	
10	522	7.6		1053	6.6		392	4.9		164	2.0	
11	450	7.6		1238	7.8		397	5.0		203	2.5	
12	431	6.3		1039	6.6		325	5.0		178	2.2	
13	450	6.6		1059	6.8		321	4.0		154	1.9	
14	351	5.1		1180	7.4		335	4.2		235	2.9	
15	211	3.1		1369	8.6		372	4.7		295	3.7	
16	102	1.5		1414	8.9		366	4.6		295	3.7	
17	51	0.7	5.7	1174	7.4		414	5.2		245	3.1	
18	13	0.2		722	4.5	30.3	403	5.1		213	2.7	
19	8	0.1		75	0.5		464	5.8		273	3.4	
20	4	0.1		41	0.3		503	6.3		359	4.5	
21				11	0.1		465	5.8		237	3.0	
22							445	5.6	55.8	232	2.9	
23							516	6.5		217	2.7	
24							394	5.0		192	2.4	
25							61	0.8		284	3.6	
26							10	0.1		334	4.2	
27							18	0.2		206	2.6	
28							11	0.1		223	2.8	
29							2	0.0		252	3.2	80.5
30										198	2.5	
31										273	3.4	
32										276	3.5	
33										243	3.0	
34										293	3.7	
35										429	5.4	
36										475	5.9	
37										289	3.6	
38										80	1.0	
Total	6846	100.0		15855	100.0		7974	100.0		7987	100.0	
Ave. Cms. Drop	8.5			11.2			15.2			23.4		

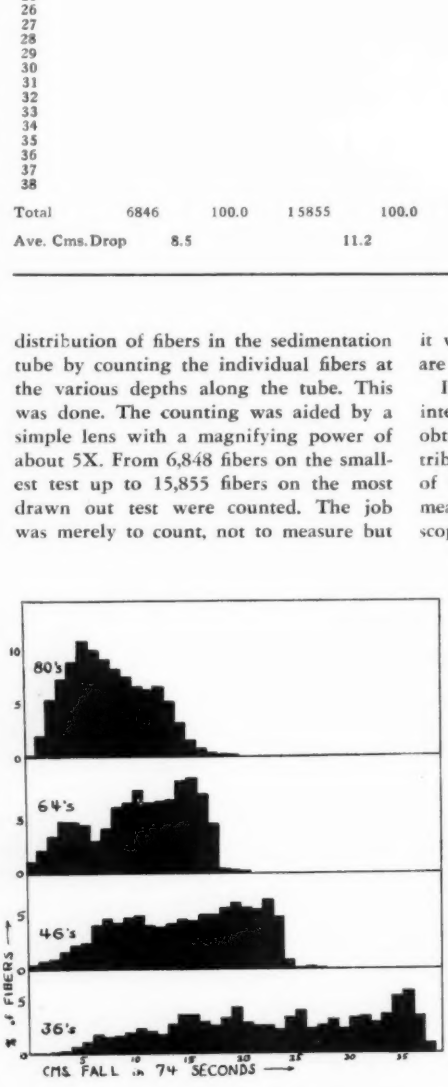

Fig. 2—Fiber Distribution by Sedimentation.

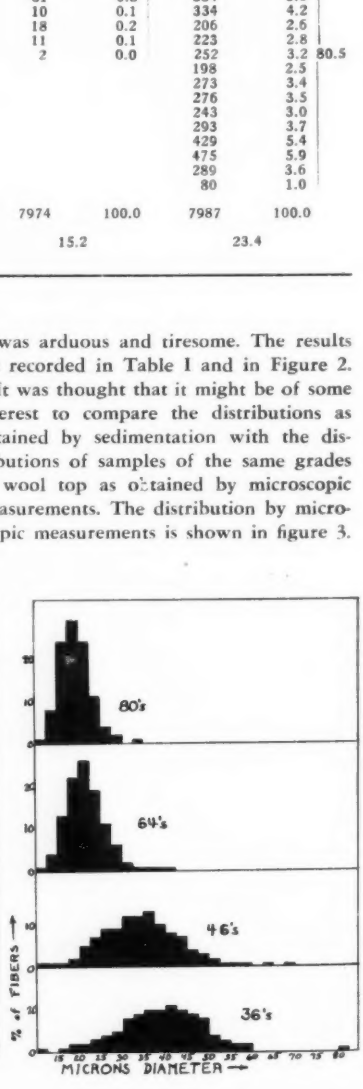

Fig. 3—Fiber Distribution by Measurement.

Discussion

It might be well to start the discussion by comparing the fiber distributions obtained by sedimentation with those obtained by mocroscopic measurement. These distributions are of interest principally with regard to the distinctness with which they show differences among samples of the several grades. The indications are that the sedimentation distribution curves, obtained even with this first crude and inexpensive apparatus, are perhaps more easily distinguishable than the microscopic measurement distribution curves. Thus, it would appear easier to differentiate between 80's top and 64's top with the sedimentation distributions. Again it would appear far easier to differentiate between the 46's and 36's tops by the use of the sedimentation distribution charts. The fiber measurement distribution charts appear to be somewhat more specific in differentiating between 64's and 46's although here the sedimentation distributions are in themselves quite clearly distinguishable.

An examination of the average sedimentation drops in cms. of the different fibers during the standard 74-second period, shows 80's, 64's, 46's, and 36's short sections giving average sedimentation drops of 8.5, 11.2, 15.2, and 23.4 cms. respectively. Contrasted with this, are average diameters for the microscopic measurements of 18.8, 21.8, about 34.5, and about 40 microns. Examining these varying averages and contrasting them with the total ranges it again might appear that the different grades of wool could be distinguished a little more clearly through fiber sedimentation than through actual fiber measurement.

There appear to be some peculiar characteristics about the sedimentation distribution curves. Some of the fibers fell almost 38 cms. in the standard 74-second period. At the same time, there were others which fell only 2 or 3 mms. It is difficult to imagine that this difference can be attributed to only the differences in diameters of the fibers. Possibly the explanation might be that the fibers which exhibited such slight drops in the standard settling times were highly medullated ones or that they were covered with a coating of grease. To obtain more reliable results, it would be advisable to degrease all samples which are going to be tested by sedimentation. This was not done in these tests.

Another peculiar characteristic of the sedimentation distribution curves is that they exhibit surprisingly large percentages of fibers with long distances of fall. Clumps of fibers settle more rapidly than individual fibers. Because of this, no clumps were counted. However, clumps might have fallen rapidly through a distance and then broken up to yield individual fibers which were counted. This factor will have to be closely examined when further tests are run.

One point was noticed in making the fiber counts. The fibers showing the greatest drops were in general coarser and easier to see than the fibers that had lower drops.

If the speed and ease with which fiber sedimentation can be ascertained should cause the method to be accepted in determining wool grades it would be necessary to set up standards based on the same techniques. In setting up such standards efforts should be made to arrive at the easiest and most practical basis for standards. It would be helpful to have a single specification system of standards. Thus, instead of specifying that a given grade should have a certain range of average sedimentation drop and a certain maximum of large sedimentation drops the grade might be specified simply by a definite maximum of large sedimentation drops of a definite range. It is recognized, of course, that any wool sample is one member of a continuous series of wools which includes the entire range of fibers from the finest to the coarsest, and that one member might have characteristics setting it at some point in between definite grade standards. It has been common trade practice to buy and sell on such between-grade identifications as 64/60's or 60/58's. Descriptive trade terms of this kind, however, presuppose well defined and accepted main grade standards.

A one specification system for wool standards as determined by fiber sedimentation might be based simply on percentages of fibers having sedimentation drops greater than one specified value. Thus, on the four samples tested and reported on in this paper, the percentages of fibers dropping more than 14 cms., are summarized in table II.

Table II. Percentages of Fibers with Sedimentation Drops Greater than 14 Centimeters

Grade of Top	*Percent of Fibers with Sedimentation Drops Greater than 14 cms.*
80's	5.7
64's	30.3
46's	55.8
36's	80.5

With the above wide differences recorded for the sedimentation drops of the different grades it would seem that such a system of standards might have some merit.

The fiber sedimentation apparatus, although set up as well as possible at the time, actually turned out to be rather crude and unsatisfactory. One needed improvement in the appartus is a more convenient method of loading the short sections into the tubes. It would appear that a wide bore glass stopcock would offer a far better loading device.

The method of making permanent records of sedimentation results by means of individual fiber counts is too tedious. It would appear far better to set up improved sedimentation columns in which the fibers that had settled to different portions of the column, could be removed at the appropriate levels, segregated into suitable containers, dried, and weighed to give the desired information of the distributions. A suggested design for such a sedimentation column is found in figure 4.

The Hardy cross-sectioning device or the large Hardy cross-sectioning device is efficient but a quicker and more convenient apparatus for the cutting of short cross sections might be devised. A diagram of such a proposed cross section cutter is found in figure 5.

Conclusions

1. It appears that it might be possible with improved sedimentation apparatus to obtain very rapid answers as to the grades of wool. In the tests reported on even with the first imperfect apparatus, useful and distinctive sedimentation distributions were obtained in 74 seconds on as many as

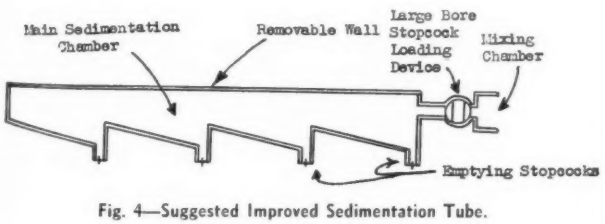

Fig. 4—Suggested Improved Sedimentation Tube.

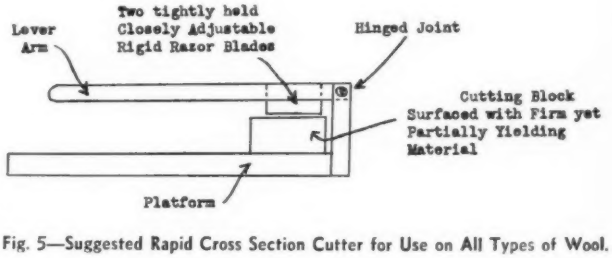
Lever Arm
Two tightly held Closely Adjustable Rigid Razor Blades
Hinged Joint
Cutting Block Surfaced with Firm yet Partially Yielding Material
Platform

Fig. 5—Suggested Rapid Cross Section Cutter for Use on All Types of Wool.

15,800 fibers. With improved apparatus it might be possible to define the grade of a wool within a period of ½ hour by using a sample of perhaps 1,000,000 or 2,000,000 fibers.

2. If the sedimentation process is a valid measure of grades of wool, it might be possible to apply it easily to grease and to scoured wool as well as top. To get the same degree of representativeness of scoured wool as on top it would be necessary to take short cross sections on a large number of staples or perhaps homogenized samples, form a suspension and mix in water, and take an aliquot of this suspension. Grease wool, of course, would have to be scoured before testing.

3. The amount of work reported here is so slight that the report has no more than qualitative significance; however, the results of sedimentation tests on short sections of four grades of top gave clear distinctions between the four grades. Whether the technique would be consistent on all wool is a matter for a considerable amount of further experimentation.

A Method for Electron Microscopy of Wool

THE National Bureau of Standards is engaged in a broad research program on the causes and nature of wear in textiles. Among the phases under investigation are the degradation effects of various physical and chemical agents. A fundamental approach to the problem is being made through the study of organic fibers by means of electron microscopy. In cooperation with other members of the electron microscopy laboratory and the textile laboratory, Max Swerdlow and Gloria S. Seeman have developed a simplified shadowed replica technique that is comparatively simple and rapid. Through this technique, fine details of the morphology of the wool fiber, both in its natural state and after various treatments, have been revealed.

The electron microscope has been a useful tool for observing objects which are thin enough or which are sufficiently small and adequately dispersed to allow the proper scattering and transmission of electrons in the conventional 50 KV microscope. The high resolving and magnifying powers of the electron microscope have thus been used with considerable success in the study of the pigments, smokes, viruses, bacteria, and a variety of other colloidal particles. On the other hand, when efforts are made to study organic fibers, ordinary techniques of direct preparation fail.

Partial solutions to the problem have been found by those concerned with the study of wool fibers. Fragments of triturated fibers of reduced and methylated wool are not adversely affected by the intense beam of electrons and are in part transparent to it. Such techniques, however, are very limited. Not only do they preclude the practical prospect of obtaining information about the surface structure of the fiber, but the possibility of giving the same fiber repeated treatment is eliminated because of the mechanical disorganization and chemical alteration produced.

The limitations of direct methods of surface observation by electron optical means has led to the development of ingenious and devious techniques for preparing thin film replicas of the surfaces of electron-optically "opaque" materials. The improvements and variations of the basic replica methods reported by a number of resourceful workers has been successfully applied to the study of many bulk materials. None of these techniques, however, is directly applicable to degraded wool fibers, since the use of excessive heat or crushing pressure in molding the replica introduces undesirable conditions. Moreover, most replica methods involve destruction of the specimen. This, too, eliminates the possibility of performing additional treatments on the same fiber.

In order, therefore, to augment the data on the structure of the wool fiber and to correlate these observations with results previously obtained by the direct disintegration of the fiber as well as by other methods, a simple, rapid, faithful replica technique was developed. This system of specimen preparation successfully combines a method useful for optical and electron microscopy. It involves making a negative replica of the wool fiber in a thermoplastic film which is thin enough to examine directly in the electron microscope and which may be shadow-cast with a suitable metal for added contrast.

Two thermoplastic materials, ethyl cellulose and polystyrene, can be used with about equal success. When a suitable solution of the resin is poured onto a standard glass microscope slide, a thin film (about 0.4 microns) is formed upon evaporation of the solvent. The separated fibers, free of grease and dirt, are laid upon the thermoplastic lacquer, and another glass microscope slide placed on top of the fibers to make a sandwich with the plastic film. The sandwich can be held together with the aid of a C-clamp. Reasonable care must be exercised in order not to twist the assembly. The clamped glass sandwich of film and fibers is then heated in an electronic oven for about 20 minutes at 90° C. The thermoplastic is thus softened to the point where it will flow and form a faithful replica of the surfaces in contact with it. The factors which affect the quality and resolution of the plastic replica are time, temperature, pressure, thickness of the film, and diameter of the fiber. To achieve the proper balance of all these elements is not a difficult problem inasmuch as the limits of control are not too critical. One or two trials ordinarily provide sufficient experience to make numerous acceptable replicas in a comparatively short time.

After the sandwich has been cooled and separated the wool fibers usually come away with the uncoated glass slide, or else they can be brushed out. These fibers having once been "fingerprinted" can be saved for further chemical or physical treatment and subsequent replication.

Shadow-casting provides added contrast as well as a three dimensional aspect to the surface details of the replica. A very thin coating of evaporated chromium is deposited obliquely upon the plastic surface. The elevations and depressions in the surface replica cast characteristic shielded radiation shadows. Where no metal is condensed transmission of the incident energy is a maximum. Where

(Concluded on Page 476)

Proceedings of the

American Association of Textile Chemists and Colorists

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JULY 12, 1948

Correspondence Regarding Buxton Meeting

THE SOCIETY OF DYERS AND COLOURISTS
England

18th June 1948

The President,
American Association of Textile
Chemists and Colourists.

Dear Mr. Herrmann:

I would like you to know how delighted I am that the representatives of our two Societies had such a pleasant and valuable exchange of views during their Buxton meeting. Only a most important engagement with the Board of Trade, in my capacity as Controller of Dyestuffs, prevented me from being at the meeting, but I have said from the outset that once we met each other the matters outstanding between us would be satisfactorily resolved.

Mr. Barritt informs me that the meeting was most cordial and enjoyable and that in addition to clearing up immediate problems, he feels sure that foundations for full and happy partnership are well and truly laid. I can assure you that this is our wish, and we will do all that is within our power to maintain and strengthen the bonds between our two bodies.

With my cordial greetings to you personally, Mr. President, and my good wishes to all your members and prosperity to your Association.

Your sincerely,
GEORGE E. HOLDEN,
President.

* * *

AMERICAN ASSOCIATION OF
TEXTILE CHEMISTS AND COLORISTS
June 24, 1948

George E. Holden, Esq., President,
The Society of Dyers and Colourists.

Dear Mr. Holden:

I deeply appreciate your letter of June 18th and the cordial message of cooperation between our two Societies which it contains. Mr. Bonnar has only partly reported his most notable experiences at Buxton and it will probably be some time before I see Mr. Appel. However, from what I have already heard, it is obvious that we are on the threshold of a very much better understanding and I sincerely hope that we may have the privilege and pleasure of collaboration, not only on the Colour Index but on scientific investigations in which we have a mutual interest.

Science recognizes no barriers and it must be evident to all progressive thinkers that the textile and chemical industries have outgrown national boundaries. I consider the development of international standards as a logical, forward step, not to restrain or curtail local initiative but as an incentive toward the perfection of dye wares and merchandise wherever they are manufactured or sold.

I reciprocate your kind personal greetings and in anticipation of the reaction of our Council, when I read your letter to them during our September meeting, I express their appreciation and the greetings of the AATCC to the membership of your Society.

Yours sincerely,
H. F. HERRMANN,
President.

Joint Meeting in Buxton on Colour Index

Shown above is the group that met recently in Buxton, England, to discuss the new Colour Index being prepared by the AATCC and the Society of Dyers and Colourists. Those present are, left to right: standing—J. Robert Bonnar, AATCC Colour Index Steering Committee: Cyril J. W. Hooper ,Editor and General Secretary, SDC; L. W. Blackshaw, Vice Chairman, Colour Index Editorial Panel, SDC; William D. Appel, AATCC Colour Index Steering Committee; seated—Job Barritt, Honorary Secretary, SDC; H. Jennison, Honorary Treasurer, SDC; F. L. Goodall, Vice Chairman of Council, SDC. Results of the meeting were reported to be very satisfactory.

CALENDAR

PHILADELPHIA SECTION
Meetings: September 24, November 12, January 28, 1949 (Kugler's, Philadelphia).

NORTHERN NEW ENGLAND SECTION
Meetings: September 24 (Andover Country Club); November 19.

SOUTHEASTERN SECTION
Meetings: July 24 (Atlanta, Ga.); September 25 (Columbus, Ga.); December 4 (Atlanta, Ga.).

WESTERN NEW ENGLAND SECTION
Meetings: September 10, October 29, December 4, January 15, 1949, February 26, April 8, May 20.

SUB-COMMITTEES
Meetings: September 16 (New York).

COUNCIL
Meeting: September 17 (New York).

RESEARCH COMMITTEE
Meeting: September 17 (New York).

NATIONAL CONVENTION
October 21-23 (Sheraton Bon Air Hotel, Augusta, Ga.).

W. B. GRIFFIN
Chairman, Ladies Committee

W. B. Griffin was born on January 26th, 1905, in Hartwell, Georgia. He lived in Griffin, Georgia, through his public and high school days. He studied chemistry for three years at Philadelphia Textile Institute and took special courses in organic chemistry at Columbia University.

He entered employment as a laboratory assistant at the Aberfoyle Mfg. Co., Chester, Pennsylvania, and then was employed by National Aniline in the laboratory and dyestuff demonstrations. He later became chief chemist for the Fabrics Finishing Corp., Paterson, N. J., and then superintendent of tin weighting and dyeing of pure silk fabrics for the Mason Dyeing Co., Easton, Pennsylvania. Since 1932 he has been a technical salesman in Georgia, Alabama, Tennessee, South Carolina and North Carolina for the Kali Mfg. Co.

Mr. Griffin has a wife, Katherine, and a son, Bill, Jr., age 13.

Special Events for the Ladies at Augusta Convention

W. B. GRIFFIN, Chairman of the Ladies Committee for the Augusta Convention, announces that registration for ladies will be handled at the main Registration Desk in the lobby of the Sheraton Bon Air Hotel. Members of the committee will be present at all times to assist in every possible manner.

All ladies who register are invited to attend the dinners, luncheons and technical sessions, in addition to the following special events that have been provided for their entertainment:

Thursday, October 21

4:30 P.M.—Tea, Augusta Country Club, Complimentary.

Friday, October 22

10:00 A.M.—Bus Tour to Points of Historical Interest, Complimentary.

7:30 P.M.—Special Dinner and Style Show, Green Room, Sheraton Bon Air Hotel, Tickets, $5.00 each, available at Registration Desk.

Saturday, October 23

Morning and afternoon open to provide time for shopping and comprehensive visits to points recommended by the Augusta Chamber of Commerce.

Other members of Mr. Griffin's committee are:

Mrs. Z. Boyce Mangum, *Assistant Chairman;* Mrs. J. W. Richardson, Mrs. Curt Mueller, Mrs. T. J. Marler, Mrs. W. S. McNab, Mrs. C. Norris Rabold, Mrs. V. B. Holland, Mrs. L. E. Whittelsey, Mrs. J. Lindsay Wyman, Mrs. R. P. Timmerman, Mrs. Sherman Converse.

—♦ ♦—

Finances for Augusta Convention

CHARLES A. SPRATT is handling the matter of finances for the 27th National Convention in a very efficient and business-like manner. The work of the Finance Committee involves the handling of thousands of dollars for a convention such as the national conventions of the AATCC. The efficiency of Mr. Spratt's committee will be proven, when the convention is over, by the feeling that everyone will be well repaid for the expense of time and money incurred. Other members of Mr. Spratt's committee are:

B. P. Barnes, *Assistant Chairman;* John L. Crist, George Dozier, William J. Kelly, Jr., H. E. Kiefer, Curt Mueller, Donald Quick, R. E. Rupp, R. Hobart Souther.

CHARLES A. SPRATT
Chairman, Finance Committee

Charles A. Spratt was born in Charlotte, North Carolina, and attended school at North Carolina State. He has been with National Aniline Division, Allied Chemical & Dye Corporation since leaving college and at present is located in Chattanooga, Tennessee.

During the war he was in the Air Corps as Aircraft Maintenance Officer and B-29 Flight Engineer. His hobby is golf.

Mr. Spratt is married and has a son five years old and a daughter three years old.

Twenty-Seventh Annual Meeting and Convention Augusta, Georgia October 21-23, 1948

Special Train to Augusta Convention

Kenneth H. Barnard, National Convention Chairman, announces that the special convention train of the Southern Railway System running to Augusta in October has been filled*. The schedule of the special train is as follows:

October 20	Lv. New York Penn Station (PRR)	3:55 P.M.
October 20	Lv. Newark (PRR)	4:10 P.M.
October 20	Lv. Trenton (PRR)	5:00 P.M.
October 20	Lv. North Philadelphia (PRR)	5:29 P.M.
October 20	Lv. Philadelphia 30th St. (PRR)	5:38 P.M.
October 20	Lv. Wilmington (PRR)	6:08 P.M.
October 20	Lv. Baltimore (PRR)	7:11 P.M.
October 20	Ar. Washington (PRR)	7:55 P.M.
October 20	Lv. Washington (SOU)	8:15 P.M.
October 21	Ar. Augusta (SOU)	9:00 A.M.
October 24	Lv. Augusta (SOU)	3:55 P.M.
October 25	Ar. Washington (SOU)	†4:40 A.M.
October 25	Lv. Washington (PRR)	5:00 A.M.
October 25	Ar. Baltimore (PRR)	5:41 A.M.
October 25	Ar. Wilmington (PRR)	6:48 A.M.
October 25	Ar. Philadelphia 30th St. (PRR)	7:25 A.M.
October 25	Ar. North Philadelphia (PRR)	7:39 A.M.
October 25	Ar. Trenton (PRR)	8:10 A.M.
October 25	Ar. Newark (PRR)	8:59 A.M.
October 25	Ar. New York Penn Station (PRR)	9:15 A.M.

* If there is sufficient demand, another special train will be added.
† Occupy sleeping cars until 7:30 A. M.

Persons who desire to travel on the special train should send their reservations to: Southern Railway System, D. H. Beck, General Passenger Agent, 500 Fifth Avenue, New York 18, N. Y. Do not send remittances at this time.

162nd Council Meeting

THE Council held its 162nd meeting in The Hotel New Yorker, New York, N. Y., on Tuesday morning, June 8, 1948. Present were President Henry F. Herrmann, presiding; John N. Dalton and C. Norris Rabold, Vice-Presidents; William R. Moorhouse, Treasurer; William H. Cady, Carl Z. Draves, Louis A. Olney and P. J. Wood, Past Presidents; Walter J. Hamburger, David X. Klein and C. Wendall Lever representing Northern New England; Raymond W. Jacoby and George H. Wood, Jr. representing Rhode Island; George L. Baxter, Charles W. Dorn, Emmett J. Driscoll, Herman E. Hager and William A. Holst, Jr. representing New York; Arthur W. Etchells, Walter F. Fancourt, 3rd, and Percival Theel representing Philadelphia; Wyss L. Barker representing Piedmont; William B. Griffin representing Southeast; Eric W. Camp representing Mid-West; Harold H. Taylor representing Western New England; Kenneth H. Barnard of the Convention Committee; Samuel L. Hayes of the Executive Committee on Research; Patrick J. Kennedy of the Intersectional Contest Committee; Leonard S. Little of the President's Advisory Committee; Douglas C. Newman of the Augusta Convention Committee; George H. Schuler of the Publicity Committee; Harold W. Stiegler, Research Director; and Harold C. Chapin, Secretary.

The Secretary's report of the 161st Council meeting and financial report of May 6, and the Treasurer's report of May 10, were accepted. The budget for the year beginning Aug. 1, 1948, presented by the Appropriations Committee, was approved; and investment of $20,000 by this committee was authorized.

The Policy Committee was thanked for special services rendered, and discharged. Its members were appointed by the President an Advisory Committee, to discuss the problems of the Association without report to the Council.

Two amendments to the Bylaws, proposed by the Committee on Constitution and Bylaws, were passed to letter ballot of the Council with approval of the meeting. The proposals were as follows:

To Article IV, Section 1, add a "Merchandise Committee." To the same Article IV, with appropriate renumbering of other Sections, add a new Section 9, to read, "The Merchandising Committee shall be composed of the President, Treasurer, Secretary, Chairman of the Research Committee, and Research Director. It shall have supervision of all arrangements for sale of merchandise by the Association and purchase of such merchandise, and of agreements for sale by others of merchandise bearing the indorsement of the Association."

To the first paragraph of Article X, Section 5, add, "To replace a Councilor lost by death or resignation, a Section may elect a new Councilor to take office immediately upon election. The Councilor or Councilors of a new Section shall take office immediately upon election."

As representatives on the Consumer Goods Committee of the American Standards Association were appointed P. J. Kennedy with K. H. Barnard as alternate, and L. S. Little with C. W. Dorn as alternate. The resignation of Winn W. Chase as Chairman of Publicity was accepted with expressions of regret, and gratitude for competent service.

The Research Committee, in absence of the Chairman, was represented by S. L. Hayes. Dr. Stiegler discussed work in progress. Mr. Bailey, engaged on the Association's completed project for the Quartermaster Corps, had resigned to accept a position in the Boston office of the Quartermaster. The C.W.S. project would be completed in July. On the International Salt Co. project, comparing sodium sulfate and chloride in dye baths, work at Lehigh University would be completed in July, while results of mill experiments by the Lawrence committee were being prepared for publication. On wash fastness, experiments were directed toward more abrasion in the Launderometer to duplicate results of commercial laundering. The American Washer and Ironer Manufacturers' Association had shown interest in these tests. A paper was being prepared for publication, on comparison of test methods for water resistance. On dimensional change part of the work on rayon, using the present tension dryer, had been completed. Through the American Viscose Co. scholarship this work would be continued, aiming at development of a smaller instrument. British attachments for the Crockmeter would be duplicated in this country and exhibited at the Augusta meeting. On the perspiration test the plate methods would be presented by

SECRETARY'S FINANCIAL REPORT — MAY 6, 1948

Received and transmitted to Treasurer,	*Applications*	*Dues, Regular & Reinstate*	*Dues, Corporate & Sustaining*	*Miscellaneous*	*Totals*
August 1, 1947, to March 18, 1948	$3,054.50	$32,261.00	$34,265.00	$24,801.19	$94,381.69
March 18 to May 6, 1948	786.00	691.00	925.00	19,041.83*	21,443.83
Total in fiscal year to date	3,840.50	32,952.00	35,190.00	43,843.02	115,825.52
Leaving deposited by Treasurer with Secretary, general,					2,000.00
Leaving deposited by Treasurer and Secretary, for salaries and miscellaneous payments					3,670.21

Miscellaneous items		*
Dividends and interest	$	323.20
Chemical Warfare Service		17,163.46
Reporter		.35
Year Books		127.70
Analytical Methods		1.00
Crockmeters		562.10
Crock cloth		114.00
Multifiber cloth, profits		310.95
Moth cloth		102.00
Water test apparatus		92.00
Dyed standards		20.00
Knitted tubing		38.95
Gas fading units		21.00
Color transfer charts		42.00
Flammability testers, royalties		40.00
Colour Index		84.00
		19,042.71
Less Bank Charges	—	.88
		$19,041.83

the committee for acceptance as a tentative standard. Three of the newly designed detergency machines were under construction. Test procedures proposed for adoption would continue to be circulated for comment from those interested.

For the Publications Committee Dr. Olney proposed supplementing the instructions for authors, already published in our Proceedings, with a note to other publications stating their privileges in reporting our meetings to extent of 500 word abstracts of papers, or publishing in full with special permission, subsequent to publication in the Reporter. This was approved. Dr. Worner had consented to continue compilation of bibliographies through the 1948 volume of the Year Book, but might then have to be relieved. An appropriation had been included in the budget for publication of the new "Analytical Methods for a Textile Laboratory," which the committee hoped to have on sale during the coming winter. Plans for the next monograph, on application of vat dyes, were under way.

For the Convention Committee, Mr. Barnard reported consideration of what to do with the profits which sometimes accrue if estimated margins of safety are not drawn upon. Definite recommendations were to be made in the light of further experience from the Augusta convention. One special train from New York New York to Augusta was already reserved, and more might be needed. Mr. Newman reported that there would be ample hotel accommodations for members giving his committee adequate notice of their plans. Full information, with reservation cards, would be mailed early in July. For Dr. Dahlen's committee, G. H. Schuler reported the technical program complete, with more than enough papers offered. Mr. Kennedy reported all Sections working on papers for the Intersectional Contest. Mr. Jacoby reported definite arrangements for the convention of Oct. 19 to 21, 1950, in the Hotel Statler, Boston, under the auspices of the Rhode Island Section, but with cooperation offered by the Northern New England Section. Arrangements by the Philadelphia Section for the 1949 convention in Atlantic City had previously been reported.

For the Corporate Membership Commitee, Mr. Driscoll reported dues receipts from new sources in excess of losses, but need of more to meet increasing expenses. Committee members were to be appointed from the new Sections.

For Professor Lindsay's Committee on Student Awards, P. J. Wood reported the design of a book plate to be inserted in the special book and the Year Book awarded each recipient as prizes. For the Northern New England Section Dr. Hamburger reported award of its first scholarship to Walter E. Bill of the Lowell Textile Institute.

For the next Council meeting, Friday, Sept. 17, in New York, was set.

For the Committee on Membership and Local Sections, Mr. Rabold noted wide geographical distribution of new membership, the stimulation to membership from new Sections, and the increasing percentage of applicants with college degrees. Mr. Camp reported increased interest in membership in the Mid-West Section following the Chicago convention.

Elected to Corporate membership were the Associated Dyeing and Printing Co. of New Jersey, Inc., Bates Manufacturing Co., the Renfrew Bleachery of Brandon Corporation, and the Clark Thread Co. of Georgia. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

Senior

G. Arky
W. M. Bayley
P. C. Beatty
J. C. Boesch
G. F. Bohler
W. H. Brockett
F. E. Bryden
P. J. Canterino
F. C. Carter
L. E. Caruthers
J. J. Cassidy
E. G. Channon
S. J. Clark, Sr.
A. G. Coates
F. E. Coe
J. F. Diamond
L. C. Dormuth
C. C. Finney
E. K. Fischer
N. R. Gaouette
G. T. Gardner
W. F. Gaston
J. B. Graham
A. G. Gruzdis
A. E. Hampshire
B. A. Hess
K. A. Howry
W. P. Holt
J. H. Hopkins
R. W. Humes
M. L. Hurwitz
R. N. Ingram
I. Isaacson
E. G. Jones
E. J. Lancaster, Jr.
W. J. L'Heureux
C. E. Lyons
F. J. MacDonald
J. W. MacNeil
H. T. Mahaffey
C. E. Maupai
R. Mazzocchia
W. L. McNab
P. C. Meldal
R. L. Merrow
D. T. Milne
G. D. Moran
E. Olsen
E. B. Otto
J. P. Patsourakos
R. E. Pent
B. F. Pimentel
A. W. Purdy
W. H. Ritter
E. N. Rosenfeld
P. B. Roth
R. F. Roy
C. E. Rummel
M. J. Scott
M. H. Seder
P. S. Sjolin
P. I. J. Skiold
O. M. Stamm
H. T. Stevens
J. L. Stief, Jr.
J. C. Stirling
N. I. Stone
C. A. Suthern
W. Tesche
R. G. Thomas
S. W. Wade
S. M. Weinstein
F. F. Wilkinson
A. Zak

Junior

N. H. Berland
R. G. Berner
B. G. Brawley
R. W. Collier
T. A. Corn
J. W. Corr, Jr.
S. A. Gudonis
A. A. Hunter
W. D. Inabnit
R. Jaramillo
G. Kalpakjian
W. A. Knott
A. Lubin
H. P. Mulligan
H. G. Parrish
L. J. Pietras
J. R. Pitt

Associate

R. P. Baynard
J. D. Connell
E. I. Cooper
P. Cook
W. T. Corn
C. C. Earle
J. G. Freedy
H. R. Hushebeck
N. W. Janson
R. R. King, III
J. S. Olesin
M. P. Pattani
J. L. Pinte
G. C. Ramey
H. M. Rubin
W. F. Simmons
N. H. VanHeek
W. B. Whitehurst

Student

L. W. Armstrong
R. S. Brooks
R. C. Ellison
R. G. Godiwala
E. J. Greene
W. I. Head
H. E. Lawrence, Jr.
B. L. Powers
C. W. Riser
H. F. Ross
A. Saltiel
J. E. Spearman
J. J. West
J. M. Withington

Transferred from other classifications to Senior membership were:

M. Lane J. J. Shapiro G. R. Turner

Respectfully submitted,

H. C. Chapin, *Secretary.*

—◆ ◆—

Meeting, Pacific Coast Section

A MEETING of fifteen Oregon and Washington members of the new Pacific Coast Section followed a dinner at the Shriners' Club, Portland, Oregon, on Tuesday, May 18. Plans for increasing membership, and possibility of local meetings, were discussed.

Respectfully submitted,

H. A. Des Marais, *Secretary.*

Members should send address changes directly to The National Secretary

155th Research Committee Meeting

THE One Hundred and Fifty-fifth Meeting of the General Research Committee was held at the Hotel New Yorker in New York, Tuesday, June 8, 1948. In the absence of the Chairman J. Robert Bonnar, who was representing the AATCC at the ISO Conference in England, Samuel L. Hayes presided.

Activities at Lowell

Dr. H. W. Stiegler reported on the activities at Lowell. Mr. Bailey, a research associate, has left the Association and is now with the Quartermaster Corps at Boston. On wash fastness Dr. Stiegler stated that they are anticipating the effects of laundering on colors and the development of equipment to enable adequate tests to be set up. The new metal tubes have arrived from the Atlas Company and are intended for use in the current model Launder-Ometer. The work on water repellency covering comparative methods of evaluating this property has been completed and it is expected that the report will be published in a few days. The work on dimensional changes in fabrics has been cleaned up so far as the work of the present incumbent of the Viscose fellowship is concerned and it is reported that a new incumbent will start in the fall.

In connection with the crockmeter it has been determined that the attachments favored by our British associates are only in the blueprint stage. As soon as we have the blueprints it is expected the attachments will be made in this country in the hope that they may be on exhibit at the Annual Convention in the fall.

The work on the Chemical Warfare project will be completed in June, and a report will be out in July.

The Quartermaster Corps project has been completed and the report is written.

The detergency work is proceeding and particular mention was made of contacts with other associations. As an example, the American Washer and Ironer Manufacturers Association (soon to include dryers) is at present cooperating with respect to mechanical washers in relation to wash fastness of colors.

Dr. Stiegler complimented the various committees on their use of visitors in their committee work even though they are not members of the committee, and saw great value in having the right people interested.

He also cautioned committee members that proposed new methods of tests should be circulated among the members of the Research Committee before their final acceptance by the Subcommittee, in order that there may be more prompt publication of methods that will prove generally satisfactory.

Referring to the International Salt project it was stated that this will continue through June and part of July. The work has reached the stage of treating the collected data mathematically in an attempt to relate the experimental work with practical work in the mill. It is hoped that this report may be published in the fall.

Washing

C. A. Seibert, Chairman of the Committee on Fastness to Washing, reported that the Atlas Company has furnished seven of the specially constructed stainless steel tubes for use in the Launder-Ometer. Work is continuing at the Institute to determine the best test conditions in these tubes to have practical significance from the point of view of commercial laundering.

Progress is reported also on the joint activities with the American Standards Association, Committee L-14, in conjunction with the ASTM on a program of determining through actual reference to women's groups what are objectionable degrees of color degradation through laundering. By this survey it is expected to learn when garments are discarded because they are no longer satisfactory, rather than depending upon technical evaluation of the significance of so-called appreciable changes from the original.

Light

W. A. Holst, Chairman of the Committee on Light Fastness, reported that the blue calibration papers have been prepared by the National Bureau of Standards and are in process of being bound into booklets. The paper is now beater dyed using the same dye as for the previous coated calibration paper A. These should be available for distribution in about six weeks. Comparative tests by the Bureau of Standards of the integrating radiation meter, known as Totalux, with the Bureaus' No. 1 meter, indicates that after some modification the device can be made to correlate quite closely with the unit at the Bureau. Developments in this direction will be followed by the Committee.

Perspiration

John Dalton, Chairman, presented the report of the Committee on Perspiration. In revising the test procedure certain factors have been decided upon. The committee has agreed to adopt the plate method and a convenient apparatus to take the place of the more cumbersome tube method of making tests. A flat multifiber fabric has been agreed upon. Pressure of 10 lbs., and a temperature of 100° F. will probably be standard conditions. For apparel fabrics, both samples to be tested as well as the white material will be saturated and it appeared that the present acid and alkaline standard solutions will be maintained. The Committee is now considering the English perspiration test and expects to have it evaluated by the time of the next meeting. Methods for testing pile fabrics are still under consideration. It is anticipated that the new method of testing will result in greater reproducibility, easier appraisal of fastness and a complete test within an eight-hour period rather than the former 18 or 24-hour test. It is hoped that all these matters can be presented as a new tentative test method at the next meeting of the Research Committee.

Dimensional Changes

Dr. W. E. Coughlin, reporting for the Committee on Dimensional Changes in Textile Fabrics, stated that there was not too much that was new. John Dalton made some comments on the progress of the Boston Wool Committee. Dr. Coughlin reported that the hosiery section of this committee are having 1,200 pairs of hose knitted in preparation for the program detailed in the previous report, following which there was considerable discussion on the evaluation of dimensional changes in knitted fabrics. It was stated that the Underwear Association has a machine which would be available to this

committee for some work. It was brought out in general discussion that there is considerable increase in interest in the shrinkage of knitted woolen garments and while this aspect of the work of the committee has not been particularly pushed it would appear that current events justify more emphasis. It is the belief of the committee that they have sufficient data to apply to this problem and this will be organized for that purpose.

Color Differences

Frank O'Neil reported for the Committee on Small Color Differences, developing the purpose and scope of the committee's activities particularly as the work will apply to the evaluation of gas fading tests, the use of photoelectric instruments, etc. Mr. O'Neil further discussed the inadequacy of the present title of this committee and stated that the committee favors the title "Visual Aids for Evaluating Color Differences." He then went on to explain the desirability of emphasizing visual aids because the use of specialized instruments limits official testing to those laboratories that can afford the relatively expensive instruments. The search on the part of this committee will be more to find those simple aids which will, if possible, be more accurate than the eye and still be reasonably rapid in use. The committee will be interested in the nature of color changes in textiles after test treatment, the exploration of visual aids, and finally a selection and recommendation of specific devices. Such considerations as strength of dye deliveries are considered beyond the scope of the committee at this time. Much of their present interest is in the use of colored glasses of various thicknesses and the use of simple colorimeters. Reference was made to a letter from the American Institute of Laundering requesting a set of chips to evaluate laundered materials. The recommendation was made that they be referred to the Munsell System for this particular application.

Finishing Materials

Dr. J. E. Lynn reported for the Committee on Standard Methods of Determining Finishing Materials in Textiles. He states that the committee has reached what appears to be an impassé because they have not been able to acquire sufficient positive tests. Previous attempts to get this information from the trade have not been successful. Because this type of information is vital to the program of this committee, they are planning to write again to resin suppliers requesting recommended tests. The committee then proposes to check these tests in which work they may need some help from the general research group. They are of the opinion that no qualitative analytical scheme will be forthcoming and further state that their work will deal only with impregnated fabric, not coated fabric.

Analysis and Testing

Professor Theel reported for the Committee on the Standard Method of Chemical Analysis and Testing, stating that nine of the eleven sections of Monograph No. 1 are complete and the other two sections are practically complete. The manuscript for this Monograph should be finished in the late summer and as reported in the Council meeting, provisions for publication have been made. It was suggested by Dr. Stiegler that in this book standard methods should be so indicated.

Detergents

Hugh Christison reported for the Committee on the Evaluation of Detergents for Wool. This committee has tested a detergency comparator and have revised the design, with an attempt to simulate the action in a dolly washer. It is expected that a new model of the revised machine will be available in a few weeks when more work will be undertaken.

Water Resistance

In the absence of the Chairman of the Committee on Water Resistance of Fabrics, Dr. Stiegler reported that they have no formal report other than that they have cooperated extensively with the recent Federal Trade Commission session on this subject.

Fire Resistance

In the absence of the Chairman of the Committee on Fire Resistance, Dr. Stiegler reported that progress in this commmitee is principally organizational and no report could be made.

Non-Woven Fabrics

K. H. Barnard reported for the Committee on Non-Woven Fabrics, that his group meets twice a year and is essentially the same committee as Committee D-13 of ASTM. They have thus far discussed the scope of their activities and are largely in an organizational state of development.

Color

Dr. E. I. Stearns for the Committee on Color stated that his committee is prepared to propose tentative test methods for the dyeing of wool with acid dyes which is essentially a standard method of applying acid dyes to wool at a strength of ½ per cent, all conditions being specified in detail. They are also prepared to release a tentative method covering the spectrophotometric examination of dyes in solution. For future activities the committee expects to act as a clearing house on information of this sort, will limit their methods to those dyes having Colour Index numbers and consider only comparison of dyes which do not differ too much from a standard.

Other Reports

There were no reports from the following committees:

Insect Pests
Snag Resistance
Chlorine Retention
Ageing of Textiles
Standard Soil

Dr. Olney gave essentially the same report on the development of Monographs No. 1 and 2 as had already been indicated in the report of the Council Meeting.

Dr. Stiegler referred to a letter from the U. S. Testing Company in which they circularized the trade to determine interest in a single source of standard soiled material for detergency tests. They appeared to be willing to act as a source for this type of material. This has a definite bearing on the activities of the Standard Soil Subcommittee of the General Research Committee and should be referred to them before any action is taken. Reference was made to the development of a standard printed soiled cloth which is already in production and the comment was made that this should be referred to the Executive Committee on Research. Mr. Christison offered the constructive comment that in his experience, certainly so far as wool is concerned, standard soiled cloth can only be produced uniformly and accurately by treatment of loose wool in the gill box followed by spinning, and this is an activity which could probably be best carried out at one of the textile institutes.

In connection with the activities of the Committee on Water Resistance, Messrs. Little and Dorn emphasized the fact that the blotting papers used in the rain tester have been found to vary among the three suppliers. Since the Association publicized these three suppliers as alternative sources for these blotters, it appears that difficulty in interpretation of the test may result from a difference in the blotters as indicated.

The following were present at the Research Committee meeting:

Samuel L. Hayes, presiding

E. C. Atwell W. L. Barker

K. H. Barnard
G. L. Baxter
W. H. Cady
H. C. Chapin
H. Christison
W. E. Coughlin
J. N. Dalton
C. W. Dorn
C. Z. Draves
W. B. Griffin
H. E. Hager
W. A. Holst
R. W. Jacoby
N. A. Johnson
A. J. Kellner
D. X. Klein
L. S. Little
J. E. Lynn
J. E. Meili
W. R. Moorhouse
L. A. Olney
F. J. O'Neil
W. F. Prien
C. N. Rabold
F. A. Ralston
B. A. Ryberg
C. H. A. Schmitt
G. H. Schuler
H. A. Scruton
C. A. Seibert
E. I. Stearns
J. A. Stevenson
C. A. Sylvester
H. W. Stiegler
H. H. Taylor
P. Theel
F. Tripp
W. V. Bergen
J. F. Warner
G. H. Wood, Jr.
P. J. Wood

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Intersectional Contest Committee

PATRICK J. KENNEDY, Chairman of the National Intersectional Contest Committee, announces the following members of this committee:

J. Robert Bonnar, Technical Director
General Dyestuff Corp.
New York, N. Y.

Frank J. O'Neil, Physicist
Worsted Division, Pacific Mills
Lawrence, Massachusetts

C. Norris Rabold, Director of Chemical Research and Development
The Erwin Cotton Mills Company
Cooleemee, North Carolina

J. Gilbert Mearns, Vice-President and General Manager
Hohokus Bleachery
Hohokus, New Jersey

Robert P. Timmerman, Laboratory Director
Gregg Dyeing Division, Graniteville Company
Graniteville, South Carolina

Frank L. Bradley, Chief Engineer
Forstmann Woolen Company
Passaic, New Jersey

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Annual Outing, NNE Section

THE annual outing of the NNE Section was held at the Merrimac Valley Country Club, Methuen, Mass., on June 11, 1948.

The attendance was about 200 members and guests of which 90 played golf.

Outing Committees were as follows:

W. P. Heintz, *Chairman.*
G. O. Linberg, *Chairman Ex-officio.*

Golf Committee

H. E. Gile, B. Nicholson, J. H. Binns.

Dining Committee

A. T. Grant, H. T. Rooney.

Soft Ball Committee

J. E. Travers.

Bridge Committee

Dr. E. R. Laughlin.

Program Committee

A. W. Mack, J. F. Sheehy.

Horseshoes Committee

F. J. Robertson.

Golf Prizes—Members

A Division—Handicap 0 to 18

1st Low Gross, John Bryant, 77; 2nd Low Gross, J. W. Bryant, Jr., 82; 3rd Low Gross, W. T. Clarke, 85; 1st Low Net, James Redmond, 72; 2nd Low Net, Alfred Grant, 76; 3rd Low Net, William Turner, 76.

B Division—Handicap 19 to 28

1st Low Gross, Fred Dushame, 88; 2nd Low Gross, J. MacDonald, 91; 3rd Low Gross, John Ormiston, Jr., 92; 1st Low Net, George Rickards, 65; 2nd Low Net, H. E. Wieland, 66; 3rd Low Net, James Cummings, 68.

C Division—Handicap 29 to 40

1st Low Gross, A. J. Brosnan, 99; 2nd Low Gross, W. Battersby, 103; 3rd Low Gross, S. P. Swett, 105; 1st Low Net, Ed Lynch, 69; 2nd Low Net, W. McBeath, 70; 3rd Low Net, James Gibbs, 74.

9 Holes—Handicap 0 to 40

1st Low Gross, F. R. Rody; 1st Low Net, A. J. Carbone.

Golf Prizes—Guests

1st Low Gross, Ed Snyder, 86; 2nd Low Gross, J. Kneeland, 86; Third Low Gross, R. Dushame, 86; 1st Low Net, W. S. Kumblad, 70; 2nd Low Net, H. A. Conner, 72; 3rd Low Net, E. Stetson, 73.

Golf Prizes—Miscellaneous

Nearest Pin on 16th Hole, Jerry MacDonald; Most 6s, H. L. Orstein (9); Most 7s, H. I. Belton (9); Most 8s, W. W. Pennock (5); Highest Score, 18 Holes, Members, Wm. Schmottlach, 170; Highest Score, 18 Holes, Guests, H. Mahoney; Putting, 1st Low, A. Silloway, 25; 2nd Low, Harry Buckley, 26; 3rd Low, George Stevens, 28.

Soft Ball

Frank Robertson	David Hamer
Leo Gleklen	Charles Bowman, Jr.
George Mandikos	Charles Herrick
Hans Walz	E. Larkin
Dick Bunting	Fred Prisley, Umpire

Horseshoes

Individual Winner, A. J. Woronka; Individual Second, Markgren; Partnership Winner, Williams and Lind.

Bridge

Individual First, Bernie Hillman; Individual Second, L. P. Litchfield.

Cribbage

Individual First, Glidden; Individual Second, Coulman; Individual Third, John Burnett.

Annual Outing, Philadelphia Section

THE Philadelphia Section held its Annual Outing on June 11th at The Atlantic City Country Club, Northfield, N. J.

Under clear, sunny skies 223 members and 48 guests enjoyed a day of golf including a putting contest and a Hole-in-One Contest, Quoits, Darts and Cards.

The Philadelphia Section cup for low gross in the Golf Tournament was won for the second time by Tom Jordan, while the Van Vlaanderen Machine Co. trophy for low net was won by J. M. Jester.

The dinner in the evening was followed by an excellent floor show, with Arthur M. Gordon, Martin Fabrics Corp., Chairman of the Section, acting as the Master of Ceremonies. Special guests of Mr. Gordon included George Williams, Illustrious Potentate of Lulu Temple, A.A.O.M.N.S., and Bertrand Hayward, Director of the Philadelphia Textile Institute.

John W. Jordan, Alco Oil & Chemical Corp., was chairman of the Outing Committee which did such an excellent job of making this affair very successful.

Respectfully submitted,
Thomas H. Hart, *Secretary.*

EMPLOYMENT REGISTER

48-1

Education: B.S. Rhode Island State College.

Experience: Chemist, print works.

Age 33; married; references; position in New England desired.

48-7

Education: Technical school, with additional college courses.

Experience: Textile chemist, with practical experience in dyeing and finishing of cotton and rayon, including resin finishes. Textile Technologist, U. S. Quartermaster Corps, during war. Good knowledge of Spanish and Portugese.

Age 26; married; references; will work anywhere.

48-8

Education: B.A., New York University.

Experience: 19 years, textile chemical laboratory.

Age 39; married; references; vicinity of New York City preferred.

Influence of Chlorination on Wool Dyeing*

DR. H. LUTTRINGHAUS
General Dyestuff Corporation

DURING the last AATCC convention you heard the New York intersectional contest paper on chlorination. At the same time Dr. Milton Harris gave a paper on chlorination. A few weeks ago you had Dr. Leonard Shapiro here explaining the features of the Alrose chlorinating process. When I talk to you today again on a similar subject it will be rather difficult to avoid duplication. I have to apologize, therefore, if I seem to repeat things which you have already heard. I do this, however, in order to maintain the continuity of the discussion.

The felting property of wool is the basis for a great part of the woolen industry. To prevent felting shrinkage of woolen articles in household washing, chlorination of wool is being practiced to an ever-increasing degree, although only a fraction of the wool sold in garments today is chlorinated.

The modification that the surface structure of the wool fiber undergoes leaves the fiber less protected from external influences. Thus the chlorinated fiber wets out more quickly and is more easily penetrated. While this feature helps the dyer and printer, it must be a considerable drawback for the wearer of a woolen shirt if he is caught in the rain.

The chlorination processes practiced in the U. S. are mainly wet chlorinations. They are carried out either on the alkaline or on the acid side.

ACID CHLORINATION.—When wool is chlorinated in an acid medium the rate of exhaustion, or better the action of chlorine on wool, is very rapid. This might result in an *uneven* chlorination. The acid processes show also a loss of protein matter, but produce a whiter wool than the alkaline methods.

ALKALINE CHLORINATION. — In general it can be said that the alkaline chlorination processes show as lower rate of exhaustion of the chlorine and therefore produce more uniform results. The main drawback of the alkaline processes is the pronounced yellowing of the fiber. This makes it difficult for the dyer to produce bright shades such as baby blue or pink.

Chlorination can be carried out either before or after dyeing.

CHLORINATING AFTER DYEING.—Let us first consider chlorination after dyeing and its influence on the dyeings. Different chlorinating processes will influence dyestuffs in different ways. Generally speaking, it can be said that most shades will be affected at least a little if chlorination is carried out after dyeing. First of all, only a process would be suitable which does not change the shade of the wool. This might be possible under certain conditions, but it is doubtful whether the results would always be the same. Even then, many dyestuffs will be affected either by high amounts of acid or by the antichloring agent, such as bisulfite. If the wool during an alkaline chlorination turns yellow, shades such as blues or violets would naturally show a more pronounced change in tone than a yellow or an orange. Any change is of course more noticeable in weaker dyeings. For these reasons an evaluation of the fastness to chlorine of dyestuffs on wool would be of very little value, as such ratings would be good only for one specific method. And even then it would sometimes be difficult to say whether a change in shade is due more to the destruction of dyestuff by chlorine and other chemicals used during chlorination, or whether the different shade of the wool is responsible. We show here an alkaline chlorination on dyeings carried out with 12 milling dyestuffs, 23 Palatine Fast, 28 Chrome dyes and 10 Algosols. The yellowing of the dyeings is typical of this chlorination. Although the influence of chlorination on these dyeings might not be regarded as very objectionable in full shades, it is preferable to chlorinate before dyeing in order to have a better contol on the final shade. However, chlorination after dyeing might preserve the tensile strength better, a result which by no means can be overlooked. The tensile strength of chlorinated wool is greatly decreased in the wet state, and such wool is damaged more easily during dyeing than unchlorinated wool.

While alkaline chlorinations usually result in yellower dyeings, acid chlorinations may influence the shade in other ways. We have here a dyeing, carried out with Palatines, which has lost distinctly in strength because the high amount of acid used in this specific chlorination made the dyeing bleed considerably. The same dyeing made on wool chlorinated beforehand by the same process is only very slightly changed.

DYEING OF CHLORINATED WOOL.—To help us understand the dyeing of chlorinated wool, we might briefly discuss the changes in the wool which are caused by oxidation. It is now an old theory that wool when exposed to light is attacked mainly at the disulfide cross-linkages. Whatever the change in the wool may be, it must be similar to the effect caused by chlorination. Light-exposed wool and chlorinated wool exhibit parallels which are very interesting. They dye similarly, both wet out more quickly *(1)* than normal wool, and if the chlorination and light exposure are carried out long enough we have even shown that they both show resistance to moth attack. *(2)* Thus the moth brought evidence in support of the hypothesis that a relation exists between light-exposed and chlorinated wool.

We have here the fleece of a sheep dyed with a combination of Fast Light Yellow GGXN Conc., Palatine Fast Pink BNA High Conc. and Alizarine Astrol B which some of you may have seen before. The light-exposed tips are red, the root parts are greenish. The same can be shown with a piece exposed in the Fadeometer. The exposed part is red after dyeing, the unexposed greenish. If woolen flannel is chlorinated without any control, the action of the chlorine is so violent that very likely uneven chlorination results. A dyeing with the same formula on a chlorinated piece shows red and greenish blotches. The red blotches indicate that here the chlorine attacked

* Presented at meeting, Mid-West Section, May 1, 1948.

more than in the other places. If you measure the alkali solubility of the red and blue parts you will find that a difference of 60 to 70% exists, which shows that the damage done to the wool is very uneven, and considerable for the red portion. This was established in the New York Intersectional Contest paper.*(3)*.

Hanks which were alkaline chlorinated with 1.5-2-3.5-4% active chlorine show a progressively redder shade, so that this formula might even be used as an indicator.

A more striking difference in shade is obtained with acid chlorination.

The upper and lower skein of the first pair are both untreated. The shade is blue. The middle pair dyed in the same bath shows the upper untreated skein as a green and the chlorinated lower part as a red. If both skeins are chlorinated an even distribution of the dyestuff takes place. This means that an even chlorination might be most important to obtain an even dyeing. You can also easily see the difference in shrinkage between the unchlorinated and chlorinated yarn during dyeing.

RATE OF DYEING.—This shows very clearly that chlorination can influence the rate of dyeing considerably.

Here we have to distinguish again between acid and alkaline chlorination. Acid chlorination usually greatly increases the immediate exhaustion, the strike being greater than on normal wool. Alkaline chlorination, however, tends to retard the exhaustion *(3)* of dyestuffs in most cases. After the normal time of dyeing, approximately the same depth of shade is obtained with an acid chlorination, while alkaline chlorination has a tendency to produce slightly weaker shades. Even if the rate of exhaustion is slower with alkaline chlorination, it cannot be concluded that better dyeings with respect to levelness are necessarily obtained by this method.

Although the rate of exhaustion is slower and consequently more level results are obtained initially on alkaline chlorinated wool, most dyestuffs have a tendency to boil off and on more readily on acid chlorinated wools. This leveling at the boil quite often more than compensates for the high initial strike. Thus more level dyeings can be obtained finally on acid chlorinated wool, provided the chlorination itself is even. To explain this with an example, we have here level-dyeing tests and exhaust tests of Sulphon Acid Blue BA. While exhaustion is complete in the case of the acid chlorination, alkaline chlorinated wool leaves more dyestuff in the bath. However, the level dyeing test shows that the acid chlorination allows a much better leveling at the boil, while the dyeing on alkaline chlorinated wool does not level well at the boil. In this case the level dyeing on alkaline chlorinated wool has to take place mainly during the time when the bath is brought to the boil. When level dyeing tests are made on yarn chlorinated with progressively increasing amounts of chlorine, it can be observed that the higher chlorination causes the better level dyeing. Thus a yarn chlorinated with 4% of active chlorine produces a better level dyeing than a yarn treated with 1.5% of active chlorine or an untreated yarn. We have here a level-dyeing acid red on untreated yarn, and on yarn treated with 1.5% and 4% chlorine; also dyeings produced with Wool Fast Blue FFGA, a milling type. When these dyeings are boiled for 45 minutes in a fresh dye bath with white wool, the highest transference is observed in the case of a 4% chlorination. While this is true for both acid and alkaline chlorination, the acid-chlorinated wool shows the better leveling.

Wash tests prove that for the level-dyeing color both chlorinations produce a poorer fastness to washing than the untreated dyeing, while Wool Fast Blue FFGA is only inferior on acid chlorinated wool. We show here similar results on Alizarine Rubinol R and Indocyanine BA, which are much inferior on acid-chlorinated wool and only very slightly inferior on alkaline-chlorination.

We probably all agree with the old rule: "The higher the affinity of a dyestuff for the fiber, the lower are its leveling properties and the better is its fastness to washing." Since chlorination can decrease the fastness to washing and can increase the level dyeing, it is not correct to say that dyestuffs have a better affinity for chlorinated wool. Actually the opposite can be the case, depending on the type of chlorination. This seems to be contrary to the commonly held conception. The reason for this is that the speed of initial absorption was mistaken for higher affinity.

DYESTUFFS FOR CHLORINATED WOOL.—A very pertinent question at this point is then the following: Which dyestuffs are most suitable for the dyeing of chlorinated wool? Since it is imperative to dye washable wool with dyestuffs which are fast to washing, most level dyeing acid colors are eliminated automatically. On chlorinated wool, especially on acid-chlorinated wool, the fastness to washing tends to be lower. With acid dyestuffs of the level-dyeing type the loss in fastness is appreciable, which makes this group of dyes even less desirable for this purpose.

METALIZED DYES. — The Palatine Fast Dyestuffs, which represent the metalized types, produce in many cases adequate fastness to washing, especially if piece goods are concerned. Acid chlorination might show a tendency to decrease the fastness to washing to a certain extent, but alkaline chlorination does not. While the exhaustion of Palatines on wool chlorinated in an acid medium is faster, and on alkaline chlorinated wool slower, compared with normal wool, the metalized types produce level dyeings in each case, even if the chlorination is not perfectly level. We suggest that the metalized ypes be dyed with only 4-5% sulfuric acid and with Palatine Fast Salt O Solution as a leveling agent, rather than with 8% of acid alone, which might adversely affect the tensile strength of chlorinated wool. The Palatine Fast dyestuffs with the best fastness to washing on alkaline-chlorinated wool are: Palatine Fast Yellow GRNA, Orange GENA, Orange GNA, Red RNA, Pink BNA, Claret RNA, Navy Blue LF, Marine Blue RENA, Blue GGNA, Brown GGND, Brown GRND and Black WANA. The other brands should be used only with reservations. Our tests were carried out on piece goods and knitting yarn, both being alkaline-chlorinated. We made the interesting observation that in 7 out of 21 cases the fastness to washing was even a little better on the chlorinated material. Our wash tests in these cases were three 30 minute washings at 120° F. with neutral soap (AATCC No. 1 for wool).

MILLING COLORS.—The milling dyestuffs constitute an important group among colors used for chlorinated wool. The brightness of the shades, combined with good fastness to washing, makes the use of these dyes necessary, as their brightness cannot be obtained in many instances with faster types such as the Chrome colors. Although some chlorinations improve the level dyeing, the same care should be taken during dyeing as is usual with this group. But anyone able to dye milling colors normally should have no trouble.

Carrying out the same three 30 minute washings as with the Palatines, we found that the following milling dyestuffs show reasonably good fastness to washing. In no instance is the fastness on alkaline-chlorinated wool inferior to dyeings on untreated wol. Our tests are based on piece goods and yarn.

(Continued on Page P471)

Recent Progress in Stabilized Finishes on Rayon Piece Goods*

RICHARD W. POWELL
Superintendent, Lincoln Bleachery

Historical Background

IN discussing recent progress in the stabilization and shrinkage control of rayon piece goods it may be of interest to review briefly the steps which have led to present large scale commercial application of such processes. Some of the weaknesses of rayons were recognized as early as 1908, when the French chemist, Eselalier, noted their low wet strength and described a process claimed to improve this appreciably. This was treatment with formaldehyde, in an acid medium, in presence of dehydrating agents.

The next major development in treatment of rayons was the introduction of synthetic resins, for which a patent was granted and assigned to Tootal Broadhurst Lee in 1929. This was the well-known anti-crease process. It was not recognized immediately that this also conferred on rayon fabrics increased wet strength and a decreased tendency to shrink. At about the same time chemists of the German I. G. Farben claimed application of urea formaldehyde resins for reducing swellability and increasing wet strength of viscose rayon. Within the last ten years additional processes involving treatment of rayon with formaldehyde for similar purposes have been disclosed. These differ from the earlier formaldehyde treatments in that they use elevated temperatures for curing the treated cloth.

The literature shows that low wet strength had been recognized as a handicap to the early rayons, and that a high degree of swelling in water was a contributing factor. It was not realized until much later that treatment for reducing the swelling power of rayon not only resulted in improved wet strength but also controlled the shrinkability and extensibility of rayon fabrics. Modern fiber research indicates that the introduction of stable cross linkages between molecules should reduce swelling, and that aldehydes and the aldehyde resins produce such cross linkages. Study of the reaction of the simplest aldehydes with viscose rayon reveals that about 2% combined formaldehyde reduces swelling almost completely. With 7.5% combined formaldehyde the rayon fibers become so brittle that they can be crushed to powder. This illustrates the control required to produce properly stabilized fabrics, at the same time avoiding embrittlement.

Methods Available

There are three main types of chemical treatment for production of stabilized and shrunk finishes on fabrics of viscose rayon, and blends of rayon with natural and synthetic fibers.

ALDEHYDE PROCESS. — The first method may be called the aldehyde process. In this, rayon fabrics are treated with a solution of a simple alhehyde, e.g. formaldehyde, or a dialdehyde, e.g. glyoxal. The glyoxal method, known under the trade name of Sanforset, has been used in commercial production of a substantial yardage of stabilized and shrink resistant rayon fabrics in the last two or three years.

The formaldehyde method has not been used commercially to any great extent in this country, but has seen considerable use in Europe. Methods of application for glyoxal and formaldehyde are similar.

APPLICATION AND USES.—To ensure uniform results in this treatment, it is essential that the cloth be thoroughly prepared and that all traces of oils, sizes and soaps be removed. This is usually accomplished by an enzyme treatment, followed by thorough boil-off with a combination of soap or synthetic detergent, and alkali such as soda ash and trisodium phosphate. The preparation may be carried out on jiggs, continuous boil-off machines or dye becks, depending on the cloth being treated and type of equipment available. The cloth is next bleached or dyed, preferably with vat colors, although other colors may be used if they will withstand the process. Following the dyeing operation the goods are extracted and dried. They are ready at this point for the application of the glyoxal. The treating solution, consisting of glyoxal and an acid catalyst such as oxalic acid, is usually applied to the cloth on a two or three roller padder in front of a tenter frame. The goods are then dried on the frame at ½" to ¾" over the finished width. Curing is effected by passing the cloth though a roller type drier or loop drier for a short period at elevated temperature. At this point reaction is complete, but to bring residual shrinkage to within 1 or 2%, and at the same time remove surplus chemicals, it is necessary to wash the goods slack with a synthetic detergent and a small amount of alkali, then extract and dry with minimum tension, usually on a loop, net or airlay drier. The final operation calls for a short framing to establish finished width and remove wrinkles. This operation too must be carried out with as little tension as possible. The key control points in the process are:

1. Uniform cleanliness of the goods.
2. Time and temperature of cure.
3. Tension controls in the final drying and framing operation.

The licensors of the process are currently working on methods to control the first two elements and minimize the human element. It is possible that some method of instrumentation may be worked out whereby the "conductivity" of the cloth, or of the last rinse water leaving the scouring bath, can be measured continuously by electrical means. It is hoped that by this means it will be possible to withdraw cloth from the boil-off bath in a uniformly clean state, free from impurities which might have an adverse effect on the stabilizing operation. With regard to the second key point in the process, curing is a function of time and temperature; within certain limits the

* Presented at meeting, Rhode Island Section, May 21, 1948.

higher the temperature the shorter the time to effect a cure. These two factors are comparatively simple to control; so the problem is to develop a device which will continuously measure an outstanding characteristic of properly treated goods and to tie this in with a speed or temperature control. Two characteristics of treated rayon which may be susceptible to measurement in this manner are its swelling in water and its solubility in cuprammonium solution.

Untreated rayon swells to a considerable degree in water and is completely soluble in cuprammonium. The swelling of treated rayon in water and its solubility in cuprammonium are reduced to an extent dependent on the severity of treatment. It is evident that any method of control on these lines will require considerable development work before it can be considered workable.

The question of tension controls in final drying and framing is much simpler, since the residual shrinkage or over shrinkage remaining in the goods after slack drying can be readily measured by a wash test and warp and filling dimensions adjusted accordingly in the framing operation. A simple electrical device already on the market, when attached to a short frame, will coordinate the yardage fed into the machine with the yardage delivered, continuously indicating, and if necessary recording, the percentage stretch or shrinkage during the operation. This controls the warp dimensions. Filling dimensions are controlled by framing to predetermined width.

The aldehyde method may be applied satisfactorily to both filament and spun rayon fabrics, and to blends of these fibers with acetate rayon. Spun rayon and wool blends have presented difficulties, possibly due to selective absorption of the catalyst by the wool; and blends of spun rayon and cotton in which cotton is a substantial part of the blend are unsatisfactory, due to severe loss of strength which the treatment imposes upon cotton. The treatment does not materially change the weight, hand or appearance of the cloth, and durability of the treatment to laundering is excellent. There is no chlorine retention, but there is some reduction of dry tensile strength. In the treatment of white goods some slight yellowing is experienceod, but this can be corrected by addition of a small amount of peroxide to the neutralizing bath. The effect of the treatment on vat dyes is negligible, but direct, developed and after-treated colors require careful selection if light fastness be a factor.

ALDEHYDE RESIN PROCESS.—The second method for the stabilization of rayons involves the use of aldehyde resins, of which there are three distinct types in current commercial use. These are urea-formaldehyde and its derivatives, melamine-formaldehyde and its derivatives, and the ketone aldehydes of which the most important from a present day stand-point is acetone-formaldehyde. In addition there are certain alhehyde resins of a more complex nature developed by the Germans and reported by American investigators sent to Germany after the war. One of the most interesting of these products, known by the Germans as Kaurit AF 1, is made by reacting glyoxal, urea and formaldehyde. This product has been manufactured on a very small scale in this country, and its properties have been studied. The Germans claimed several advantages for the compound, among which were freedom from formaldehyde odors during application, excellent wash fastness, and no necessity for washing goods after treatment to remove excess formaldehyde. The latter would be a tremendous advantage, as washing after treatment, necessary with current methods, adds considerably to the cost of the operation. Laboratory and plant tests on the product indicate that it compares favorably with the urea-formaldehyde and melamine-formaldehyde for shrinkage control, that the wash fastness is good, that no yellowing is noted, and that cured unwashed samples do not develop odors on storage. At present the resin is costly to manufacture and this is its greatest drawback.

The uses of urea-formaldehyde, and more recently melamine-formaldehyde, are too well known to require lengthy description. It should suffice to say that methods of application follow closely that detailed for glyoxal, but the degree of control is not as great. There is much less danger of tendering the goods if reasonable precautions be used. The advantages of these resins lie in their extreme versatility. They may be used to produce a wide range of shrink resistant finishes adaptable to almost all types of apparel wear, including the various blends of rayon with cotton, acetate, wool and nylon. Properly applied they may be used not only for stabilization and shrinkage control, but also to confer crush resistance and improved draping qualities. The various types vary somewhat in their wash resistance, but a correct selection of the appropriate resin, with knowledge of the optimum application procedures, will produce extremely wash-fast results. There is no appreciable loss in dry strength under such conditions, and there is a pronounced increase in wet strength. Generally the melamine types are considered to possess wash fastness superior to the urea types, although their cost is somewhat higher. The main drawback of the resins in general use has been so-called chlorine retention, not so much on dyed goods as on white. This comes from the fact that urea formaldehyde resins, and to a somewhat smaller extent melamine resins, absorb chlorine during the usual laundry procedure for white goods. Since the average laundry uses no anti-chlor, the absorbed chlorine is retained in the form of chloramines. During drying the chloramine decomposes liberating acid, which lowers the strength of the cloth. While as yet there is no resin of the melamine or urea types which will not show some chlorine retention, recent developments have resulted in production of melamine resin treated fabrics which retain chlorine much less and which, probably due to greater heat stability of the chloramine formed, show no appreciable loss in tensile strength when subjected to several launderings.

There is one type of aldehyde resin which, due to its chemical structure, can be termed non-chlorine retentive. This is acetone formaldehyde. The other properties of this material are similar in nature to those of the urea- and melamine-formaldehydes. It is applied in the same manner, with the exception that catalists used to polymerize the resin are alkaline. Caustic soda, soda ash and many other alkalies may be employed. When it is properly applied the stabilization and wash fastness of this product are excellent; but it does have one serious disadvantage, which probably accounts for its late appearance in this field. This is its tendency to yellow during the drying and curing operation, particularly if the goods be over-dried or over-cured. Satisfactory results can be obtained however, with minimum yellowing, if necessary controls are worked out in each individual case. Very slight yellowing can be cleared, as in the glyoxal treatment, by a mild bleach following curing.

Acetone-formaldehyde is best applied to all rayon fabrics, or to spun rayon and cotton blends. On rayon-acetate blends the acetate seems to act against the catalyst, inhibiting a complete cure, while on rayon wool blends, the wool is made harsher by the alkaline catalyst.

CAUSTIC ALKALI PROCESS. — The third and final method in use at the present time involves treatment of the cloth with concentrated caustic alkali solutions, generally caustic soda. The cloth is passed through a concentrated solution

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Current Processing Problems of Acetate and Viscose Rayon Fabrics*

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DURING the war, many styles and varieties of synthetic fabrics were discontinued. This was due not only to government restrictions, but to the general shortage of synthetic yarns, the disappearance from the market of certain yarn sizes, and the lack of experienced labor. Consequently an effort was made to style fabrics which would yield the greatest yardage from a given amount of yarn. This resulted in a general lowering of fabric quality among some fabric manufacturers, as well as a lowering of finishing quality among some finishers.

Today, from the consumer's demand for increased style and beauty of texture, accompanied by a general improvement in fastness, the dyeing and finishing industry sees the reappearance of many of these prewar fabrics. Even during the war years we all realized what was ahead of us as soon as conditions returned to so-called "normal", and the finishing industry foresaw the need for quality improvement.

During the war very few types of new processing equipment were offered to the trade. With an eye to the future, many plants improved their steam and power plants; installed modern singeing equipment and setting machines; capitalized on the advantages offered by use of stainless steel dyeing equipment, hydraulic padding, continuous vat dyeing units, and heavy duty enclosed tenter frames as well as the over feed pin tenter. High speed dryers were installed as an aid to general drying, and served satisfactorily as curing units for the numerous resin finishes. We all remember the financial condition of a large part of the finishing industry prior to the war. Today it is different. This is reflected not only in the modernization of plants, but in general interest in improving the fastness of the finished product. Prior to the war only a limited number of synthetic fabric dyers were equipped with facilities to determine the fastness of their product. Recent tabulation has shown an additional 38 new laboratories in the eastern area alone, with modern facilities and competent trained personnel. Undoubtedly a large part of this laboratory need and interest was due to experience gained in handling government contracts. It is significant to note however, that the industry has continued these control laboratories and is constantly increasing the scope of its efforts to include research for improvement of processes and efficiency of production departments.

We all realize that the processing of synthetic fabrics offers many complex problems, which vary from day to day. We realize that volumes could be written on the nature of these problems and the solutions developed for advancement and utilization of synthetic yarns. It is the purpose of this paper to discuss only those problems which are recent and timely.

Presetting Woven Fabrics

To eliminate dye creases and obtain proper shrinkage control of fabrics constructed of plied yarns with high percentage of acetate, it is necessary to preset these fabrics on a continuous full width boil-off machine. Many of these machines are equipped with an additional compartment to allow pretreatment in a solvent emulsion for removal of grease and dirt from the fabric prior to entering the setting machine.

To improve the general surface appearance and reduce operating costs, it is common practice to wet out medium and light weight spun acetate-viscose fabrics, except those styles constructed from special twisted yarns. To accomplish this, a machine constructed like an old type crabbing machine is used. This consists of a tank fitted with stainless steel rollers, a set of squeeze rollers, open width washer, and take-off rollers. The fabric is immersed for approximately three seconds at 140° F. in a bath containing a non-ionic wetting agent, lightly squeezed and batched immediately without washing. It is then enzymed and scoured on the dye reel. This equipment would be ideally suited for the application of enzymes; but it has been found in many instances that this tends to fix throwsters tint on the acetate fiber, necessitating an additional bleaching operation. This type of machine is also suited for caustic pretreatment of flat viscose rayon fabrics before dyeing and printing.

Presetting of Acetate and Acetate-Viscose Flat Knit Fabrics

For years knit goods dyers have been plagued with dye creases, crush marks, and surface distortion on flat knit fabrics containing acetate. Standard practice has been to convert the fabric to tubular form either by sewing with an easily removed stitch, or by tacking 18 to 20 inches apart with a regular button machine. The fabrics are then scoured on the reel and dyed at a low temperature.

Although this procedure has proved successful in handling of narrow width fabrics, it has limitations in handling of the wider fabrics. Several plants are utilizing a simply constructed presetting machine for these. It consists of a tank approximately 4 feet deep, fitted with two or three rollers which allow the folded, tacked or sewn fabric to be immersed from two to four seconds at 210°-212° F. It is then carried over a reel in open form and immediately sprayed with cold water. To soften and lubricate, a sulfonated oil is added to the setting bath. After presenting, the fabric is run into trucks and is ready for the dye reel.

Since practically no yarn lubricating oil has been removed from the fabric in the presetting operation, it is advisable first to scour for twenty minutes in a short bath containing a synthetic detergent and a small amount of soda ash (0.025 grams per liter) at 160° F. The bath may then be brought slowly to full volume with cold water. The scouring bath may be used for the dyeing opera-

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tion with temperature slowly raised to 180° F. After dyeing the bath should be slowly cooled to 90° F. by overflowing with cold water before dropping.

Cleaning of Soiled Greige Goods

Dyers handling synthetic fabrics have problems from soiling of greige goods with dirty knots or blotches of grease and dirt from processing. Several factors influence the dyer in deciding what method to follow in cleaning. As a rule dirt and grease are easier to remove prior to any heat treatment. For example, after an embossing operation it is practically impossible to clean a crepe fabric containing dirty filling. Likewise when certain plied yarn fabrics are wet out prior to the setting operation, complete setting is not obtained and crepeing action may be too rapid, causing break marks and a general surface distortion of the fabric; while on other constructions crepeing action is retarded to such extent as to prevent proper fulling of the fabric.

Several combinations of solvents, detergents, bleaching and penetrating agents are offered by chemical manufacturers. One which has worked successfully on many types of fabrics consists of an aliphatic hydrocarbon solvent (prepared to specification CS3-40), soap, sodium silicate and hydrogen peroxide. Flat fabrics which are heavily soiled must first be desized and given one end on the jigg, or may be run through the aforementioned modified crabbing machine at 140° F., with the following emulsion:

8 quarts sodium silicate.
4 quarts 140 volume peroxide.
6-12 lbs. soap.
4-6 quarts aliphatic hydrocarbon
1-1½ quarts non-ionic emulsifier

Bulked to
60 gallons with water.

The fabrics are then given a light squeeze to prevent drain marks and allowed to lie rolled, or in covered trucks, for several hours.

Taffeta and other similar fabric constructions which easily moire due to batching on reels, are processed entirely on the jigg. Usually several ends at 140° F. are required to clean these fabrics.

Fabric constructions which require reel processing are best scoured with soap or synthetic detergents in combination with pine oil and soda ash (0.025% per liter). The scouring properties of these detergents, aided by the increased mechanical action of the dye reel machine, generally give satisfactory results.

When slightly stained warp knots are found in multifilament underwear fabrics, the fabric may be treated with a weak solution of oxalic acid at full width through a continuous machine, either before or after scouring. A better hand is usually obtained if the fabric is treated prior to the scouring operation.

Some results of recent plant experiments with peracetic acid for bleaching and cleaning fabrics containing acetate or viscose, and combinations of these fabrics with cotton, are very interesting. Although sufficient work has not yet been done to warrant definite conclusions, I feel that this new development will prove an additional valuable aid in handling of synthetic fabrics.

Fume Fading of Acetate Fabrics

Fading caused by exposure of acetate fabrics to action of certain fumes containing nitrogen compounds is still an important problem to the dyer, converter and consumer. To overcome this with best results it is necessary for the dyer to carefully select his dyestuffs and inhibitors. For those fabric constructions which may be processed at a high temperature, and in which fastness to light is not required, the azo blues still offer the best solution to the problem.

Many fabrics cannot be processed at high temperatures, thus eliminating use of azo blues. To process these fabrics the dyer must select with care the anthraquinone dyestuffs for light and medium shades to assure maximum fastness to light and atmospheric fading. The advantage of using this select group of acetate dyestuffs and planning dyeing and finishing operations for maximum light and fume fastness is that these selected anthraquinone dyestuffs properly applied, are from two to three times as resistant to fume fading as the ordinary types of anthraquinone dyestuffs now on the market. A wide selection of dyestuffs is available for producing medium and dark shades.

The permanent types of inhibitors offered by various chemical concerns during the past two years have improved the fastness of acetate fabrics to atmospheric fading after laundering; but on many fabrics these inhibitors alone do not completely solve the problem. In general the best and most consistent results have been obtained by careful selection of dyestuffs, protection by permanent type inhibitors applied during the dyeing operation, and further treatment with an alkaline inhibitor in the finishing operation. One must bear in mind that almost all inhibitors lower the light fastness of some dyestuffs, though in other instances light fastness is actually improved. To obtain balanced formulae and best results in this type of work, it is necessary for the finisher to run control tests in the laboratory to determine proper amounts of chemicals for various fabric constructions.

Developed Dyes on Acetate

Some dyers have experienced difficulty in obtaining a consistent shade of developed black on acetate. It has been proved that when all other factors are constant the carry-over of nitrous acid from the diazotizing bath is the prime cause of variations in color and fastness from one lot of finished goods to another. To eliminate this it is recommended that 1% of sulfamic acid, based on total weight of fabric, be added to the second rinse bat. Those developers which are prepared with alkali should be added directly to this bath, and the pH corrected to 4.5. With the newer type of developers derived from substituted phenols, such as 1, 3, 5-tri hydroxybenzene, which are easily soluble in water, it is necessary first to adjust the sulfamic acid to pH 4.5 with sodium acetate, before adding the developer and coupling in the normal manner.

Vat Dyeing of Acetate and Acetate-Viscose

There are still many problems to be solved in the vat dyeing of acetate-viscose fabrics. By carefully controlling saponification of the acetate fiber, satisfactory results have been obtained on some blended fabric constructions. Apparently the high molecular types of vat colors will not dye cellulose acetate of acetyl content in excess of 34 per cent. Some of the anthraquinone vat dyes are subject to atmospheric fume fading when dyed on cellulose acetate, unless the surface of the acetate fiber be saponified to a given degree. This is borne out by the fact that when acetate dope is colored with Vat Blue GCD or Vat Blue BCS and extruded into yarn, this fades very rapidly on exposure to nitrogen dioxide fumes.

Acetate will absorb high molecular vat dyes providing it is sufficiently swollen at the time the dyestuff is applied. Somewhat weaker dyeing will result if the dyestuff is first applied and the acetate subsequently swollen.

I do not know of any available commercial equipment which will handle acetate in a highly swollen condition without stretching or distorting the fabric. Shirting shades have been successfully dyed with the high molecular types of

vat colors on a Williams Unit according to the following technique. The greige fabric was first run through the Williams Unit at 60 yards per minute, using 1½ ounces of caustic soda per gallon at 200° F. It was then scoured, dried at a low temperature without undue tension and dried. The acetate at this point was 98 per cent soluble in acetone. The fabric was then padded with a liquor containing, in addition to the vat dyestuff, Blancol, 4 percent hydroquinone, 15 per cent alcohol and water. After padding, the acetate-viscose fabric was run directly into the Williams Unit containing 1½ ounces caustic soda and 1½ ounces sodium hydrosulfite per gallon. Speed was maintained at 60 yards per minute with a temperature controlled at 200° F. The fabrics were then rinsed in cold water, acidified with acetic acid and batched, after which they were soaped on a dye reel with an addition of perborate to the soap bath, rinsed and dried. A good union was obtained on both fibers. Tests showed that 92 per cent of the acetate fiber was still soluble in acetone.

Since the acetate fiber is constantly using up caustic soda in the Williams Unit, continuous titrations are necessary to determine the correct flow of caustic soda into the reducing bath. Slight swelling caused by the pre-saponification of the acetate increases the yield of the vat dyestuff on the acetate fiber by approximately 100 per cent.

Results on fabrics containing dull filament acetate, following the same procedure, were not as satisfactory. Although the fabric was evenly dyed, because of tension applied to the fabric at this elevated temperature in the presence of strong alkali, the fabric was lustered to such extent as to be unacceptable. It is plausible to believe that if there were reduction of temperature, and if the tension could be reduced to a minimum, more satisfactory results might be obtained on fabrics constructed with dull filament acetate.

Recent commercial experiments have shown that on some fabric constructions improved results are obtained by the vat-acid process. In this instance improvement over the pigment-pad process may be attributed to the greater volume of alcohol which can be added to the padding solution without affecting dispersion of the vat dyestuff. There is definite indication that a wider group of important organic swelling agents can be used in this process. Consequently there is possibility of obtaining better penetration of the vat dyestuff within the acetate fiber, resulting in a deeper color value.

Evaluation of Small Color Differences

There have been attempts recently to clarify the rating methods of certain tests for fastness of dyed fabrics. Most rating of color change today is visual, which involves human error. One person's opinion may be as honest and well justified as another's but with the result that a given test sample can be rated as "fair" by one, and "poor" by the other. It is generally felt that "an appreciable change of color," should be defined, and some mechanical means devised for its evaluation. The research committee of the AATCC has recognized this need, and has appointed a committee for study of the problem. It is hoped that in the near future they will be able to devise a simple instrument to measure small color differences.

In summary, an attempt has been made to present in brief pre- and post-war conditions relating to plant equipment and processing. Some problems relating to the processing of synthetic fabrics have been discussed, and practices needed to correct these faults have been suggested.

Discussion

1. Mr. Kerr stated that a piece of fabric dyed Burma Rose had been submitted to a commercial testing house for a standard AATCC gas fading test and was rated "poor". Later a sample from the same fabric was submitted to this laboratory for a recheck and was rated "good". It was asked what caused this discrepancy.

Mr. Scull reported that this variation could be attributed only to human error, because the procedure for evaluating gas fastness had been proved satisfactory when properly conducted.

2. Mr. Greer then asked if there were gases other than nitrogen dioxide which might cause gas fading.

Mr. Scull stated that there were other fumes which could cause fading, but it was his opinion that in the fading of acetates the main offender was nitrogen dioxide.

3. Mr. Neal then asked the possibility of obtaining a blue dyestuff gas fast on acetates, light fast, and possessing good dyeing properties.

Mr. Scull replied that he did not know of any such dyestuff or know of anyone likely to produce such in the near future.

4. Mr. Kerr reported investigating the consistency of the standard dyeings used in the AATCC gas fading test. He showed results obtained by fading simultaneously five different samples of the standards obtained fresh from the AATCC. There were discrepancies in the rate of fading.

The speaker replied that there had been two lots of standards dyed. The first was dyed with Celanthrene Brilliant Blue FFS manufactured in the late 30's, while the second was dyed recently with a current supply of this dyestuff. It was noted that due to a slight improvement in the dyestuff, the recently dyed standards have slightly more resistance to gas fading. It was judged by the committee, however, that this variation is not sufficient to warrant changing the rating. A fabric that would be rated "poor" or "good" according to the first lot of standards would still be rated "poor" or "good" with the latest standards.

5. Mr. Ordway asked whether it would improve the dyeing properties of certain acetate dyestuffs to subject them to a colloidizing treatment.

Mr. Scull replied that this treatment would have very little effect on the dyeing characteristics of an acetate dye as this depends mostly upon the molecular structure of the dyestuff.

6. Mr. Ordway wanted to know if there were any differences in fading between bottled and city manufactured gas, to which Mr. Scull replied that no such difference had been found to affect the procedure or accuracy of the test.

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Stabilized Finishes—

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of caustic soda containing a protective colloid and wetting agent, on a three roll padder, aired for a few seconds, immediately neutralized in a bath of acid or sodium bicarbonate, and thoroughly rinsed. Since the treatment is usually applied to the fabric in the greige state, the usual scouring and dyeing operations may follow in their accustomed manner. Undue tension in these operations should be avoided, and final drying and framing operations should be carried out with minimum tension, if proper shrinkage control is to be obtained. Mill experience over the last two years indicates that by using somewhat higher concentrations of caustic soda than originally recommended, and cutting the skying time to a minimum, some earlier difficulties such as harshness of hand and thinning of the cloth may be avoided. The process produces better results on some cloth than

on others. Filament rayon warp cloths seem to yield the most satisfactory results, though this may be a matter of individual experience. It is the only process known to the speaker which seems capable of stabilizing cloths containing acetate in the warp without any marked change in the acetate.

Conclusion

In conclusion I should like to add that the number and versatility of processes available for shrinkage control and stabilization leave no technical reason why the majority of rayon fabrics should not be finished within definite shrinkage limits, just as most cotton fabrics are finished. It is unfortunate that with competition on the increase some converters seem unable or unwilling to pay the additional price for fabrics which can be guaranteed washable. A partial answer may lie in the production of stabilized finishes at considerably lower cost than at present. Most of the processes available today are costly in terms of labor and materials and require simplification. A process eliminating the final slack washing, drying and framing operations would be a step in the right direction and it is within the realm of possibility.

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Chlorination—

(Continued from Page P465)

	C.I.
Sulphon Yellow RS Extra CF.....Pr.	187
Milling Yellow O.....Pr.	139
Supranol Yellow RA	642
Supranol Orange RA Conc.....Pr.	152
Acid Anthracene Red GD Extra.....	443
Supranol Red PG Extra CF.....	430
Supranol Red RA	430
Supranol Red PBX-CF.....	430
Supranol Brilliant Red BA CF.....Pr.	405
Cloth Red BN High Conc.....	262
Wool Fast Blue BLA Extra CF	833
Wool Fast Blue GLA Extra	833
Wool Fast Blue FFGA	833
Brilliant Indocyanine 6BA CF.....Pr.	222
Brilliant Indocyanine GA CF.....Pr.	223
Brilliant Milling Blue BA New CF....Pr.	37
Indocyanine BA .....Pr.	128
Supramine Green BL.....	...
Alizarine Cyanine Green GHN Extra..	1078
Alizarine Fast Grey BLN.....Pr.	206

We have to mention here the strange behavior of the Sulphon Cyanine brands. They show considerable variation on the different types of chlorinated wool. It is imperative to use a small amount of bichromate in the dyebath, as chlorinated wool seems to have a much greater tendency to destroy these dyestuffs which, as you know, might result in brown shades. We show you here dyeings of Sulphon Cyanine 5RA carried out on different chlorinations. You see that the shades vary from the original blue to a dull brown. It is, therefore, possible to obtain good dyeings of Sulphon Cyanine brands on chlorinated wool, but it is evident from the above tests that we cannot generalize and say that Sulphon Cyanine brands are suitable for the purpose. If you do not know your chlorination, it will be necessary to establish the facts with a laboratory dyeing. We believe you will find that you obtain better results with these products on acid-chlorinated wool than on alkaline-chlorinated wool. It is, however, necessary to neutralize the wool thoroughly before dyeing. This is valid for all chlorinations where acid is used in the last step.

CHROME DYESTUFFS.—For washable woolens, dyestuffs of very good fastness to washing are always required. Therefore, wherever possible, chrome dyestuffs will be used. We have investigated most of the commercial chrome colors on piece goods treated with a certain type acid-chlorination, and on piece goods with an alkaline chlorination. The tests were also carried out on knitting yarn which was alkaline-chlorinated.

3, 10 and if necessary 15 wash tests were carried out with the dyeings on acid-chlorinated piece goods. Each wash test was conducted for ½ hour at 120° F. with 0.5% neutral soap (AATCC No. 1 for wool). This test is probably much more strenuous than a woolen garment would receive at home. In no case did a chrome color show a breakdown after three such washings, and we can even say in a general way that practically all true chrome colors will stand ten such washings without showing serious loss of depth. We have observed too, that in the case of the chrome colors the fastness to washing was not inferior on this acid-chlorinated material to the fastness on normal wool, and there was no staining of white wool, cotton or rayon.

Dyeings on a different type of piece goods which were chlorinated alkaline, were at least as fast as on the untreated material.

An alkaline chlorination on knitting yarn showed practically the same results. Again 10 washings were carried out and only in a few cases was the loss of depth appreciable. But in no case was the fastness to washing inferior on the chlorinated material. Thus we can say that chrome dyestuffs which produce good fastness to washing on normal wool will also show good fastness on chlorinated wool. However, we would like to draw your attention to the fact that several dyestuffs changed their shade considerably on one type of chlorination. Picramic Brown, Acid Anthracene Brown KE, Chrome Green No. 1 and Anthracene Chromate Brown EBA turned much yellower, while Acid Anthracene Brown RHA turned distinctly redder and Chromogene Black ETO considerably greener.

VAT COLORS AND LEUCOESTERS.—When chlorinated wool is washed it turns yellower, since any white obtained with sodium bisulfite or a reduction bleach will be eliminated. Exposure to light leaves chlorinated wool also yellower than normal wool. Furthermore, during dyeing the shade of chlorinated wool is affected. This means that bright and delicate shades are dulled considerably during dyeing or washing. So far it is not possible to eliminate this drawback entirely, but it can be largely overcome by a peroxide bleach after dyeing. Here we encounter another difficulty, that most dyestuffs do not stand peroxide bleaching. Therefore vat colors and Algosols, which represent the leuco esters, will probably enter the field of wool dyeing more and more. They of course stand a hydrogen peroxide bleach. They are desirable not only because of this feature but also because of their excellent fastness to light and washing. Such dyeings can also be chlorinated and bleached after dyeing. We show here several mill samples of chlorinated slubbing dyed partly with vats and partly with Algosols.

Conclusion

Experimental work has shown that chlorinated wool can be dyed level just as readily as untreated wool, provided the type of chlorination is known and provided the treatment itself is level.

Practically all chrome dyestuffs which are fast on normal wool will produce good fastness on chlorinated wool. Palatine Fast dyestuffs will be satisfactory within limits. Many milling colors will be necessary because the brightness of their shades cannot be obtained otherwise. For ultimate fastness to both washing and light, and in cases where a peroxide bleach is necessary, vats or Algosols will be required.

References

(1) La Fleur, Textile Research Journal, Jan. 1948. 39.
(2) Luttringhaus, Dyestuff Reporter 37, No. 2, P. 57, 1948.
(3) Intersectional Contest New York Section, ibid. 37, No. 7, P. 221.

Discussion

A. G. Alexander: In a recent paper before the Association on shrink-proofing of wool, there was a statement that after

wool had been made shrink-proof by the chlorination method, it was shrink-proof when laundered with soap. When that same wool was laundered with a synthetic detergent its shrink-proof qualities were said not to be good. In the course of your work in evaluating your colors by wash tests I would be interested to know if you observed any such condition.

Dr. Luttringhaus: As our wash tests were carried out by AATCC test number 1 for wool, we did not use detergents, but I think it is possible that after some alkaline chlorinations there may be shrinkage in an acid bath, while no shrinkage occurs in an alkaline bath.

Mr. Alexander: Alkaline detergent bath?

Dr. Luttringhaus: If you add small amounts of an alkali to the detergent, shrinkage would not occur.

Elmer F. Smith: Did I understand you to say that the acid dyestuffs requiring sulfuric acid, that normally dye level on untreated wool, are useless on chlorinated wool?

Dr. Luttringhaus: If you have wool which is washable, you want dyestuffs which are fast to washing. Since these level dyeing products are not fast to washing they would be useless. Your wool would not shrink but your dyestuff would wash out. It wouldn't help much if your sweater that didn't shrink had no color left.

Harold T. Nelson: I understood you to say that this chlorinated wool would turn yellow on exposure to light. Do you have any idea of the time, under ordinary sunlight, that it would take to show noticeable change?

Mr. Flint: We have no particular knowledge as to how many hours it takes. Ordinary wool turns yellow with prolonged exposure. With chlorinated wool I think it would take less than half as long.

Mr. Nelson: The reason I asked is that in laundering, my wife exposed a garment in the sunlight for at least an hour, and there was noticeable change in shade from front to back. I was wondering if this was accentuated in the wet state as compared with the dry state.

Mr. Flint: It is possible.

J. R. Bentert: Was the garment bleached or dyed a baby shade,

Mr. Nelson: Bleached white.

Mr. Bentert: Isn't this possibly due to sulfur dioxide?

Dr. Luttringhaus: That is just it because after chlorination sodium bisulfite is generally used as an antichlor. That whitens the wool enough to make it saleable but it will turn yellow very quickly in washing and light.

Mr. Flint: Any reduction bleach will. It would do that even on normal wool, but chlorinated wool will turn much yellower than the unchlorinated in this instance.

Mr. Nelson: What would be the best method to restore whiteness?

Dr. Luttringhaus: Hydrogen peroxide.

Mr. Nelson: I took it to the laboratory and used hydrogen peroxide. It helped a lot but was not entirely satisfactory.

Mr. Flint: Was it an alkaline peroxide bath?

Mr. Nelson: Yes.

Mr. Flint: For how long?

Mr. Nelson: Over night.

Mr. Flint: I have never seen it that bad.

Leslie Meyers: Do any of the dyeing methods you speak about have further effect on either the tensile strength or alkali solubility of the wool?

Dr. Luttringhaus: I think the tensile strength of chlorinated wool is adversely affected during any subsequent dyeing process.

Mr. Meyer: Is there any variance between chrome dyeing and vat dyeing or Palatine dyeing?

Dr. Luttringhaus: Yes. First of all the high amount of acid used with the metallized types will give less tensile strength; next will be chrome colors.

Mr. Meyers: How about peroxide bleaching afterwards, does that have any effect?

Dr. Luttringhaus: It might.

Ralph W. Holbrook: I think everybody that works with chlorinated wool agrees with you when you say it isn't too difficult to dye chlorinated wool except in real light shades. Most of the problems are with whiteness of chlorinated wool which will be affected in shades such as pink or baby blue. Has anyone ever tried to determine what the yellowing matter is? If we knew we might eliminate it.

Dr. Luttringhaus: Nobody knows.

Edward J. Siegrist: In one of your displays showing the difference in shade between the untreated wool and the various percentages of chlorination, were these dyed with a single dyestuff or combinations? I believe it varied from gray to red.

Mr. Flint: They are all the same combination, a combination to show unevenness.

Dr. Luttringhaus: We used this to show the parallelism between tippy and chlorinated wool.

Harold W. Doyle: In using milling colors of the fulling types of neutral dyeing, is the dyeing rate fast?

Dr. Luttringhaus: Well, it depends on a number of factors. If you have alkaline chlorination the dyeing rate is probably distinctly slower than on normal wool, but if you have acid chlorination the dyeing rate will be increased in the beginning. When you reach the boil, you have about the same depth as on normal wool, but the leveling on acid chlorinated wool will be better than on normal wool.

Mr. Doyle: On your exhibit of Sulphon Cyanine was there chrome used in the bath in the one that went very brown?

Dr. Luttringhaus: No, not with this one.

Mr. Flint: A small percentage was used in this one, which helped retain the true shade to a certain degree.

Dr. Luttringhaus: It is more difficult to retain the normal shade of Sulphon Cyanine Blue on alkaline chlorinated wool.

—♦ ♦—

Nylon Dyeing

This paper by Harry Clapham was published in our May 3rd issue. This discussion followed its presentation at the May 1st meeting of the Mid-West section.

Discussion

Chairman Jones: I am sure that some of you may have questions.

Edward J. Siegrist: What would you recommend for unions of spun nylon with filament nylon?

H. F. Clapham: It would depend on the construction of the fabrics and depth of shade you are going to dye. If you had a fabric that wouldn't show up junctions, I expect that you could use acid colors, but in a fabric where there was enough filament nylon in strips you would probably have to use acetate colors to get a satisfactory dye job; that is, unless you have really heavy shades. It is possible to dye maroon, navy, bottle green and shades of that type satisfactorily with acid colors on the jig.

Leslie Meyers: How would you dye combinations of nylon and mercerized cotton in fast colors, say equivalent to twelve shades brown, or developed brown?

Mr. Clapham: The same types of colors that are used for the straight cotton would probably be satisfactory, with the exception that you would have to balance them up by selecting added types, to cover the nylon properly. You could still use your developed color and develop them on nylon along with the development on cotton. The fast is that there have been some mixed cotton and nylon fabrics made, particularly for Army use that were dyed with vat colors, and you can select combinations of vat colors that will do pretty well on those mixed fabrics. Light fastness offers somewhat of a problem and careful selection would be necessary for satisfactory results. In fact, only a limited range of shades would be possible with vat colors. It is also important to mention that high temperatures would be necessary to get good coverage on the nylon. It is usual to dye close to the boil using Sulfoxite in addition to hydrosulfite to maintain proper reduction.

ABSTRACTS

Resin Finishes in Wool Textiles

M. Lipson, Canadian Textile Journal, page 52, Vol. LXV, No. 8, April 16, 1948.

Attention has been paid to the effects produced by vinyl polymers. In order to produce deposits within the wool fiber it is necessary to synthesize the polymer within the fiber as the resin molecules are so large that they will not penetrate within the wool structure. By using a catalytic system which will produce free radicals within the fiber, it has been found possible to bring about internal polymerization in a rapid manner. The wool is first treated in a dilute solution of a ferrous salt and then immersed in an aqueous solution of the monomer containing a trace of hydrogen peroxide. Interaction of the ferrous salt and the hydrogen peroxide produces a free hydroxyl radical and this initiates the polymerization. It has been found that the polymer so produced is almost entirely within the fiber.

Two-tone dyeing effects may be produced by the use of acid and basic monomers. Wearing properties of the treated wool were found to be increased.

Surface coatings of resins will probably be more effective than internal deposits but it will be necessary to develop a process in which small quantities only are applied. The ideal process should be one in which a thin surface deposit is applied and the physical properties of the resin do not differ greatly from wool, producing a non-felting product with increased wear resistance and minimum alteration in the handle. By combining internal and surface treatments the advantages of both types should be conferred on the fiber. An internal deposit should also prevent relaxation shrinkage. Other applications of resins are briefly discussed.

Dyeing of Nylon Staple

Louis I. Fidell, Canadian Textile Journal, page 48, Vol. LXV, No. 8, April 16, 1948.

Nylon will withstand alkaline scouring, even severe caustic treatments, far beyond that tolerated by other protein fibers. New white staple requires only a mild scour. In blends, whatever method of scouring is required for the other component is suitable for the nylon.

Reducing strippers such as the soluble sodium and zinc sulfoxylate formaldehydes in acidic baths are most useful for nylon.

The dyeing of staple nylon or its blends requires no great modification of equipment used for other staple fibers or blends. Dyeing machines used for wool or rayon will handle nylon satisfactorily.

Dyes for nylon to meet all requirements to fastness desired or found in other fibers are available in many shades. There is considerable discussion on the selection of dyestuffs and lists of suitable dyes are given.

A New Method of Fixing the Goods on the Screen Printing Table

Ciba Review, page 2387, No. 65, March, 1948.

An adhesive wax is used to fix the goods on the screen table. The method consists of covering the table with an oil cloth or a coating of synthetic resin. The molten wax is applied from a bottomless metal trough, which is drawn slowly and evenly over the table until a layer of the desired thickness is produced. The fabric to be printed is attached by gentle pressure and adheres firmly to the table without wrinkling and is not detached even when large blotches are printed. The following wax composition has proved serviceable:

560 gms. paraffin wax
280 gms. vaseline
160 gms. rosin

1 kg.

Improving the Properties of Fibers and Dyeings by Treatment with Hydrophobic Melamine-Formaldehyde Compounds

A. Landolt, Journal of the Society of Dyers and Colourists, page 94, Vol. 64, No. 3, March, 1948.

The melamine resin discussed in this paper is a hydrophobic derivative of trimethylol triaminotriazine. The chemical and physical properties of this product are given. The use of this product for the following applications to cellulosic fibers is discussed: anti-swelling treatment, improvement of wet strength, improvement in resistance to abrasion, resistance to shrinkage, resistance to water spotting, decreasing affinity for dyes, improving the resistance of vat dyeings to the effects of exposure to light and weathering and improving the fastness to chlorine of dyeings. Its use in imparting anti-shrinkage and anti-felting properties to wool are also discussed.

Photomicrographs of cross-sections are used to show that the product penetrates into the fibers. The hypothesis is put forward that the resin inside the fibers produces cross-linking of the principal valency chains of the cellulose, and so counteracts the tendency of the fiber to swell when in contact with water.

Furnisher Faults in Printing and their Prevention

C. S. Jones, Indian Textile Journal, page 237, Vol. LVIII, No. 687, December, 1947.

Insoluble components of the print paste may become lodged in the engravings of the roller causing that portion to print less deep. Remedies suggested include the use of thickeners which have good powers of suspension, solvents for dyestuffs, printing oils to increase the flow of the print paste and a brush furnisher.

Where frothing is encountered the use of surface tension reducing agents is suggested. The use of sighting colors where unsighted print pastes are being used is recommended to indicate the appearance of faults which otherwise would go unobserved. The use of a small amount of sodium or potassium chlorate may cure gelatinization of starchy thickenings. Proper adjustment of the brush furnisher is emphasized to insure the right contact. Care should also be exercised to insure the complete removal of all print pastes of opposite reaction from the furnisher brush. Brushes may be rinsed in a weak solution of bichromate.

Elastic *N*-Substituted Polyamides

Emerson L. Wittbecker, Ray C. Houtz and W. W. Watkins, Industrial and Engineering Chemistry, page 875, Vol. 40, No. 5, May, 1948.

Elastic *N*-substituted polyamides were obtained as a result of an investigation of *N*-substitution and a study of the effect of chemical structure on a number of physical properties, especially those important to a textile fiber. The size, nature, distribution and amount of substituents can be controlled to produce polymers varying from the hard, tough, high-melting unsubstituted polyamides to soft, tacky, low-melting 100 per cent *N*-substituted polyamides. Intermediate in properties are the fibers and films possessing long range elasticity.

• PATENT DIGEST •

PAUL WENGRAF

Crimping Textiles—Especially Yarns F, 1

U. S. Pat. 2,435,891
(Amer. Viscose Corp., Lodge, February 10, 1948)

The invention consists principally of delivering softened yarns into a nip between two rollers. One of them is a cage-like drum giving the yarns a permanent crimped form. The yarn (10) is fed through a tube (11) into a pipe (15) in which another pipe (14) discharges a stream of a softening agent, a plasticizer or the like. The yarn (10) is impregnated and carried further by this softener and finally drawn through a nozzle (17) to the nip between the cage—like drum (2) and the resilient full roll (8), running the same speed as (2). Feeding the yarn or tow (10) has to be effected at a higher speed than that of (2) and (8); thus the yarn accumulates slightly on the drum and causes thereby distortion and crimping. From the construction shown in the attached drawing it can be seen that a channel (7) is closed by cage (2) and roller (8) as well as by flanges (22) and (23) fixed to the top and bottom plates of the channel. The channel (7) has the purpose of delivering some hardening agent, gaseous or liquid, in a permanent stream to the yarns running over the left side of (2). Mostly a stream of hot air will be sufficient to fix the yarns in their crimped condition but any hardening or curing substance can be applied as well. In case the filaments might adhere to a large part of the circumference of (2) the air or steam entering the cage-drum between the ribs (3) will push down the crimped material which will drop in a vertical direction as shown in the drawing. Of course any combination of suitable agents used for fixing the yarns in the crimped state can be applied by these means.

Fig. 1.

Crimping Textiles—U. S. P. 2,435,891

References cited by the Patent Office are amongst others:

U. S. Pat. 2,067,251 (Celanese): An apparatus is described which produces staple fibers by blowing the cut staple fiber material in the direction of their path to separate the single filaments.

U. S. Pat. 2,204,341 (Courtaulds): Crimping threads or filaments is attained by passing them over a conveyor and forcing them by streams of air through a V-shaped opening of this conveyor.

U. S. Pat. 2,105,852 (I. G. Farben): Viscose fibers which are only decomposed to cellulose xanthate are subjected to a treatment with fluted rollers.

Other references are:

Brit. P. 458,477 (Tootal Broadhurst): Loose wool is subjected to compression to give it a curly appearance and impregnating it at the same time with a formaldehyde-urea condensate which is cured thereafter.

Brit. P. 450,612 (Deutsche Bekleidungsindustrie): A urea-formaldehyde is used for impregnating artificial fibers; they are curled thereafter and the resin is condensed. The curl is said to be permanent.

Discharge Prints on Acetate of Cellulose—Thiocyanate Impregnation D, 2, 02

U. S. P. 2,436,059
(Eastman Kodak, Scull-McNally, February 17, 1948)

It is well known that discharged areas on dyed cellulose acetate fabrics have the tendency to bleed out and to cause blurred unclear outlines around the printed designs ("halo's"). This defect is especially noticeable when ageing has to be carried out in moist steam. For obtaining fast multicolored discharges alongside white discharge prints vat dyestuffs are quite generally preferred which require particularly the use of moist steam, making it therefore still more difficult to keep the outlines of the white pattern very sharp. It has been proposed in former patents to add different thiocyanates to the white discharge pastes to bring them more to the acid side, for instance in U. S. Pat. 1,651,639 (Brit. Dyestuff Corp.), Ca- or Ba- thiocyanate; U. S. Pat. 1,981,907 (Du Pont), zinc thiocyanate; U. S. Pat. 1,931,108 (Du Pont), guanidine thiocyanate. These modified discharge pastes gave quite good results, but in printing the white pastes alongside vat colored discharge pastes it has been observed that a carry-over from the thiocyanate-containing white paste to the alkaline vat pastes causes formation of a scum and consequently many inconveniences in the printing operation. The inventors solved the problem by impregnating the fabrics with thiocyanate in a padding operation and adding some swelling agents to this solution. The specification enumerates the thiocyanates of Ca,Zn,Al,Mn,Mg,Ba, Na and K. Thiodiglycol and triethylene glycol are mentioned as appropriate swelling agents. The clearness and the sharpness of the discharged areas are said to be well improved. Obviously no carry-over has to be apprehended. The method is said to be especially useful when applied to screen printing. Here a thiocyanate-containing printing paste might seriously damage the screen forming filaments, for instance those consisting of nylon, pure silk, vinyl polymer threads, while in the case of the present invention thiocyanate does not come in contact with the screen proper. An example teaches preparing a predyed acetate cellulose fabric with 6 parts by weight of zinc thiocyanate, (44% solution), 2 parts by weight of thiodiglycol and 112 parts water.

References cited by the Patent Office are amongst others:

U. S. Pat. 2,289,461 (Celanese): Describes a special dischargeable dyestuff of the amino azo type and comprises the use of a discharge paste composed of thiocyanate, formaldehyde-sulfoxylate and a penetrant.

U. S. Pat. 2,065,125 (H. Dreyfus): Cyclic diethers such as trimethylene dioxide are used as impregnating agents improving the printing results.

U. S. Pat. 2,037,013 and 2,031,594 (H. Dreyfus): The same effect as above is obtained by incorporating oxanones, dioxane or the like in the spinning dope.

Another reference can be found in Brit. P. 579,718 (Brit. Celanese): Acid dyestuffs are fixed on acetate of cellulose by adding to the dyestuff paste (containing Xylene Milling Blue GL) sodium or another inorganic thiocyanate.

Printing Indigosols—Betaines or Sulfobetaines as Assistants D, 2, 04

U. S. Pat. 2,437,554
(Durand & Huguenin, Ratti-Brandt, March 9, 1948)

Ester salts of leucovat dyestuffs (Indigosols) differ largely in their solubility. Generally the sulfuric acid group—HSO_3—confers this property to the dyestuff preparation but in certain events even the sulfuric acid esters are difficultly soluble. Many assistants have been recommended for improving the homogeneity of these dispersions for instance Glyecine, dihydroxy-diethylenesulfide, ethylene glycol, solutions salt (sodium salt of benzylsulfanilic acid) and the like. However even these auxiliary agents could not disperse some of the most difficultly soluble type. The inventors discovered that salts of *betaines* or *sulfobetaines* have a superior effect in this respect. Betaines are the internal salts of ammonium carboxylic acids, and sulfobetaines are the corresponding salts of ammonium sulfonic acids. These compounds are prepared by transforming a tertiary amine by alkylation into a quaternary ammonium compound and introducing thereupon in a suitable manner a carboxylic or a sulfogroup. According to one of the examples a printing paste is made up with 40 p. of an Indigosol dyestuff, 50 p. urea and 50 p. of the sulfobetaine of dimethyl-phenyl-benzyl-ammonium sulfonic acid and the usual ingredients (starch-trag. thickener, nitrite, soda ash). The color is developed by passing the fabrics through 2% sulfuric acid, warmed at 70° C, for 8 seconds.

References cited by the Patent Office are amongst others:

U. S. Pat. 2,302,753 (Durand & Huguenin): Relating to Indigosol pastes, containing triethanolamine salts and the like as dispersants.

U. S. Pat. 2,224,280 (Durand & Huguenin): Overoxidation of Indigosols is avoided by adding ammonium nitrate to the paste.

U. S. Pat. 2,217,846 (Gen. Aniline): Describes the formation of betain-type compounds intended quite generally for use as textile assistants.

U. S. Pat. 2,211,126 (N. A. Co.): Organic esters of polycarboxylic acids (succinates, phthalates, glutarates, etc.) are added as assistants to vat prints but not to Indigisols.

Other references are:

U. S. Pat. 1,989,784 (Brit. P. 420,095): Proposes pyridine betaine for pasting vat dyestuffs. Brit. P. 466,265 (both I. G. Farben) recommends sulfobetaines as pasting agents for vat dyestuffs. Indigosols are not mentioned in these references.

Cellulose Zincate Solution—Urea Added G, 2, 01

U. S. Pat. 2,434,621
(United Merchants & Manufact. Inc., Mantell, Jan. 13, 1948)

It is well known to dissolve rayon in an aqueous solution of sodium zincate and to use these dispersions for finishing purposes (See reports in AMERICAN DYESTUFF REPORTER 1947, 546, U. S. Pat. 2,419,341, and 1946, 460, Ger. Pat. 749,-082). The present invention comprises an addition of urea to the zincate solution. It is claimed that not only the solvency power is improved so that any kind of rayon waste can be used in this process but that also this solution is highly effective at room temperature and up to 120° F. while the former methods had to use refrigerating devices. A particularly good mixture is said to be composed of 4.5% zinc oxide, 10% caustic soda, 10% urea and the balance water. It is of course not only possible to apply the ready-made cellulose solution to a fabric but also to dip a rayon fabric in this solution and to dissolve thereby superficially portions thereof, to form a hardening gel on the fabric's surface. The solutions obtained are more transparent than those prepared without using urea.

References cited by the Patent Office are amongst others:

U. S. Pat. 2,158,494 (Tootal Broadhurst): Describes treating a crease resistant cellulose, prepared by a urea-formaldehyde impregnation, with a swelling or mercerizing agent such as caustic or sulfuric acid.

U. S. Pat. 2,289,085 (American Enka): Cellulose zincate solutions are manufactured by dissolving a cellulose which has been previously treated with NaOH at about 100° C. with sodium zincate in the cold. Stannate solutions are also within the scope of this patent.

A full description of this process has also been given by the inventor in "Textile Research Journal" of October 1946 p. 481.

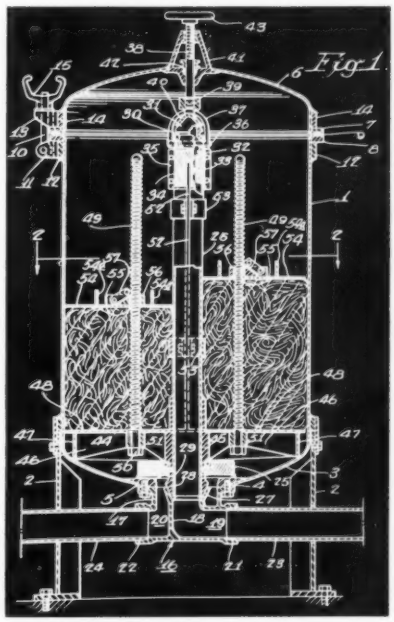
Dyeing Apparatus—for Fibrous Stock C, 6

U. S. Pat. 2,434,719
(Venango Eng. Co., Robertson, January 20, 1948)

Loose fibrous material is charged into the apparatus (1) described in the present invention. The material rests on the perforated plates (48) and here it is compressed and held in position by other perforated plates (54) sliding down the screw on the ratchet bar 49). After charging the vessel it is closed by placing the cover (6) on top and turning the hand wheel (43) which presses down the stand pipe (26) and forces it with its tapered bottom end into the opening of pipe (19). Dyestuff solutions can thus circulate either coming from (19), streaming through stand pipe (26) and through holes (33) over the plates (54), passing the material and being removed by (20) and pipe (17) or they may run the inverse way. Anyhow a uniform penetration is secured by the plates fixed by pawls (57) on both sides which engage the teeth of the ratchet bars.

A reference cited by the Patent Office:

U. S. Pat. 2,322,743 (Butterworth & Sons): Protects a package dyeing machine of a special construction regulating automatically the flow of the dyeing liquid.



Dyeing Apparatus—U. S. P. 2,434,719

Stabilizing Cellulosic Textiles—(Shrinkproofing)—Glyoxal Used G, 2, 04

U. S. Pat. 2,436,076
(Cluett, Peabody & Co., Pfeffer-Epelberg, February 17, 1948)

Reference is made to U. S. Pat. 2,412,-832 (see Patent Digest in the AMERICAN DYESTUFF REPORTER 1947 p. 337). The older as well as the present patent cover obviously the "Sanforset" methods. The characteristic feature of both of these patents is the use of *glyoxal* as a

stabilizing and shrinkproofing agent. The older patent which was issued on Dec. 17, 1946 (application date Oct. 30, 1943) protects a method for stabilizing regenerated cellulosic material, thus rayon or staple fiber, by impregnating it with an aqueous glyoxal solution to which an acid catalyst (oxalic acid) and a resin precondensate such as melamine formaldehyde have been added. The dried fabrics are baked at temperatures between 212 and 350° F. The present invention describes about the same process, while omitting the addition of resin precondensates. The conditions under which an optimal effect can be obtained are well fixed in the claims: the impregnating solution has a pH value between 1 and 2.5 and it contains a mixture of glyoxal (between 1.12% and 7.5%) with an acidic catalyst (oxalic acid like in the older patent). The goods are first dried at about 212° F. and later on heated at a higher temperature. It might be remarkable that the older patent contains a modification of a process, protected by a later patent. This can be explained according to the specification of the present (later) patent: two applications, possibly the basis of this patent, have been abandoned and thus not been published in the meantime.

References cited by the Patent Office are amongst others:

Brit. P. 547,846 (Cilander): Stabilizing with formaldehyde (sthenosage) in combination with etherifying or esterifying agents.

Brit. P. 518,167 (Charbin): Describes stabilizing of pile fabrics with paraffin emulsions and "aldehyde material" for instance formaldehyde, hexamethylene tetramine, glyoxal and the like.

For other references see AMERICAN DYESTUFF REPORTER 1947, p. 337.

Electron Microscopy—

(Concluded from Page 456)

thick elevations and ridges occur transmission is a minimum. The photograph plate records the intensities, in reverse.

The chromium shadowed thermoplastic replicas are then examined in an ordinary light microscope. Photomicrographs may now be taken of them. The glass slide bearing the negative replicas may also be inserted in a photo-enlarger, or desired areas may be selected for further observation in the electron microscope. In the latter case ⅛-inch No. 200 stainless steel specimen screens are placed over the desired areas with the aid of a low-powered microscope. The glass slide bearing the replica and the specimen screens is slowly immersed into a dish of water. The film with the screens still in place can thus be floated free of the glass and retrieved from the surface of the water by turning it over and out with a dry glass slide or a piece of paper. After drying, the thin shadowed plastic replica supported on the specimen screen is ready for examination in the electron microscope.

Thus, with this method the structural changes in textile fibers resulting from various chemical and physical factors can be studied. Alterations in surface structure brought about by such factors as abrasion, flexing, repeated loading, acids, alkalies, chlorination, heat, sunlight, moisture, and other elements of degradation may be studied. The manifestations of fiber structure may in turn be correlated with the morphological modifications resulting from actual wear in service. The fundamental problem of the molecular structure of organic fibers cannot be solved by electron microscopy alone, but considerable information may be determined that is of interest to the textile technologist and to those concerned with the subject of wear resistance.

With this in view, attention was concentrated on the study of wool. The wool fiber as shorn from the sheep generally consists of three principal concentric layers—a thin outer covering of scales (cuticle), a middle region (cortex), and a central core or pith (medulla). Throughout the literature, it has been suggested that the ability of wool fibers to felt, tangle, and curl is dependent upon the direction and shape of the imbricated scale structure, and that the cuticle serves to protect the fiber from chemical and mechanical degradation. It has also been recently suggested that the three dominant cellular structures are encased in an amorphous material which serves both as a matrix and as an intercellular cementum, and that the cuticle layer is in reality covered by this same matrix material.

The present study confirms, at least partially, this theory of the architecture of the wool fiber. Electron micrographs of the surface replicas of mechanically abraded and unabraded wool fibers reveal that the scale is inhomogeneous and consists of a double layer. The outer layer is a smooth covering for the under structure and shows no specific surface feature. Other investigators have shown this "amorphous plastic layer" to be readily digested in an enzyme as is the featureless intercellular cementum which exists between the scale and the cortex as well as between the cortical cells themselves. The similar reaction to enzymic treatment suggests that these smooth featureless layers are of the same composition.

When this lacquer-like covering is removed by abrasion a rigid striated structure is revealed. The corrugations (ridges and furrows) run more or less parallel to the longitudinal axis of the fiber. They are a feature of the scale itself and are not dependent upon, or a reflection of, the formation and size of the cortical cells. This is borne out by the fact that this corrugated structure is seen in the overhanging portions of the scales under which there is no cortex. Upon additional abrasion the scales are polished away leaving a smooth filamentary structure with slight vestiges of the former imbricated surface. More rubbing removes the next amorphous plastic layer under the scales and exposes the cortical cells themselves imbedded in the cementum. By this time, the fiber no longer manifests its characteristic filamentary structure and as such, is destroyed.

The fabrics studied were mechanically abraded by means of an apparatus[1] designed by Dr. H. F. Schiefer of the Bureau's textile laboratory. A rotary disc of parallel, flat metallic strips is applied to the fabric. During the abrasion process fragments of the cloth fall off. This debris as well as the fibers bordering the hole worn into the fabric were examined. Hundreds of specimens were obtained and studied. The diameter of the fiber replicas represents 80-90% of the actual diameter of the wool fiber. Shadowed replicas, prepared by the described method, have been examined with the RCA 50 KV Type EMU electron microscope. Preliminary scanning of the replicas were made at low magnifications without the projector pole piece, while selected areas were studied at higher magnifications. The electron micrograph negatives were contact printed to another medium lantern slide plate and optical enlargements were made from these reversals. The surface structure of the negative prints of the shadowed replicas can be interpreted in the same manner as one would perceive a landscape shadowed with oblique sunlight.

Note

Complete technical details of this work will be published in a forthcoming issue of the National Bureau of Standards *Journal of Research.*

[1] H. F. Schiefer "Solution of problem of producing uniform abrasion and its application to the testing of textiles," J. Research NBS 39, 1 (1947) RP1807.

TRADE NOTES • NEW PRODUCTS

• Perkins Soap Representative

The appointment of Charles Mathieu, Jr. as special sales representative in New York City for the Perkins Soap Company of Springfield, Mass., was announced recently by George Perkins, president.

Mr. Mathieu, formerly Director of Information for the International Wool Secretariat, will contact sales and merchandising offices of textile mills in connection with the sale of Boconize, durable mothproofing compound. The Perkins Soap Company is distributor in the New York and New England states for Boconize, manufactured by the Bocon Chemical Corp.

• Du Pont Appointments

Appointment of Ernest R. Cathcart, veteran manager of the Du Pont coated fabrics plant at Fairfield, Conn., to the position of staff advisor to the company's Fabrics Division management was announced recently.

Harry J. Jenemann, former assistant manager of the Du Pont plant at Newburgh, N. Y., was made manager of the Fairfield plant, succeeding Mr. Cathcart.

Charles C. Quenelle, former production superintendent at Newburgh, was made assistant plant manager at Newburgh, succeeding Mr. Jenemann.

• Officers, PTI Foundation

Charles W. Carvin, President of Charles W. Carvin Co., Inc., New York and National Chairman of the Philadelphia Textile Institute Development Fund, has been elected to membership on the Board of Trustees of The Philadelphia Textile Institute Foundation, it was announced recently by Emil R. Pohlers, Executive Director of the Foundation.

On the occasion of the Foundation's annual meeting, held in the directors' room of the mansion on the new site for the new Philadelphia Textile Institute at School House Lane and Henry Avenue, Germantown, Pa., the following officers were elected for a term of one year, ending June, 1949: President, Colonel Millard D. Brown, Continental Mills, Inc.; First Vice-President, Theodore B. Hayward, Swift and Company, Inc.; Second Vice-President, Fred C. Scholler, Scholler Brothers, Inc.; Treasurer, W. Lyle Holmes, Jr., Archibald Holmes and Son; Secretary, Russell C. Osborne, Rider-Osborne-Devine, Inc.

Attending the Annual Meeting of the Philadelphia Textile Institute Foundation, June 3rd, 1948, School House Lane & Henry Avenue, Germantown, Pa.; Left to Right: Theodore B. Hayward, Swift & Company, Inc.; Edward H. Rakestraw, Hyde-Rakestraw Co.; Bertrand W. Hayward, Director, Philadelphia Textile Institute; Benjamin Gibbs, Gibbs Underwear Co.; Robert A. Smith, American Viscose Corp.; Russell C. Osborne, Rider-Osborne-Devine, Inc.; Millard D. Brown, Continental Mills, Inc.; Edwin G. Michie, Andrew Y. Michie & Sons Co.; DeHaven Butterworth, H. W. Butterworth & Sons Co.; Kenneth E. Booth, Booth Knitting Mills; Gerome Leonard, Gerome Leonard Company; W. Lyle Holmes, Archibald Holmes & Son; Rinaldo A. Lukens, Continental Mills, Inc.

Other members of the Board of Trustees include: DeHaven Butterworth, H. W. Butterworth & Sons Company; Clarence L. Ederer, Ederer, Inc.; Benjamin Gibbs, Gibbs Underwear Company; Everett L. Kent, Kent Manufacturing Company; Gerome Leonard, Gerome Leonard Company; Lindsey H. Mason, S. & M. Dye Works, Inc.; Edward H. Rakestraw, Hyde-Rakestraw Company; James L. Shields, Charles J. Webb Sons Co., Inc.; Robert A. Smith, American Viscose Corporation.

• Westvaco and Food Machinery Corporations to Merge

The Boards of Directors and managements of Food Machinery Corporation and Westvaco Chemical Corporation have reached an agreement for the merger of these two companies. Food Machinery Corporation, as the surviving company, will change its name to Food Machinery and Chemical Corporation. The business of Westvaco will be operated under the direction of its present management as the Westvaco Chemical Division of the company and Westvaco's interest will be represented on the Board of Directors.

The managements of the two companies have been exploring the advantages of a merger over an extended period. While the business and products of the two companies occupy fundamentally different fields, they are more complementary than would appear at first sight. A substantial portion of Food Machinery's basic business has moved into agricultural chemical fields and toward the chemical aspects of food processing. Westvaco finds design and production experience in the equipment field and actively developed agricultural outlets essential in the profitable exploitation of its chemical manufacturing and unique raw material potentials. The extensive program which Westvaco has for development of soda ash and of phosphorus operations in the intermountain area properly complements Food Machinery's long term plans. In addition to the foregoing, the merger will provide the advantage of broader diversification of products.

• To License Mercury Cell

Mathieson Chemical Corporation will negotiate licenses for its new stationary mercury cell for the production of chlorine and caustic soda with domestic as well as foreign producers, it has been announced by Thomas S. Nichols, president.

A technical staff is being organized and trained under the direction of Dr. William C. Gardiner, who completed development work on the electrolytic cell and will be available after September 1 to advise on construction, installation and initial operation, Mr. Nichols stated.

Producing 50 per cent caustic liquor directly at the cell, the recently announced unit is said to require less floor space and power, and less costly construction materials than European mercury cells.

• New Fleet Line Soaper

Riggs & Lombard, Inc., Lowell, Massachusetts, manufacturers of textile wet finishing equipment, announce a new Fleet Line Soaping Machine now in production.

The new soaper, as shown in the accompanying diagram, may be used for soaping only one side of the cloth, or, by a tandem set-up, for soaping both sides. One of its distinctive features is a doctor blade, which may be adjusted to regulate the amount of soap carried to the cloth.

It is stated that the machine will handle all types of woolen and worsted fabrics at speeds of 20 to 60 Y.P.M., depending on conditions and requirements.

At present the soap level is maintained manually, but it is expected that installations in the near future will incorporate automatic constant level controls.

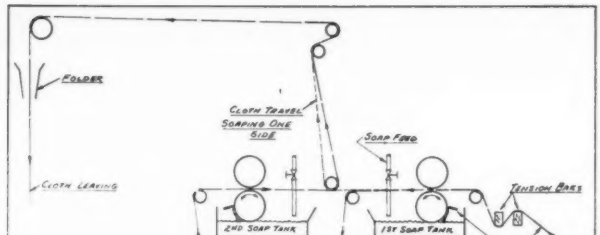


Diagram of New Fleet Line Soaper.

• NETF Scholarship Awards

The New England Textile Foundation has announced that it has awarded 24 freshman scholarships for the 1948-49 scholastic year. Sixteen of these scholarships are at Lowell Textile Institute, four at the Textile School of R. I. School of Design, two at New Bedford Textile Institute and two at Bradford Durfee Technical Institute. In practically all cases, the students were assigned to the school of their choice.

The scholarship has a value of $500.00 per year and will be renewed in the sophomore, junior and senior years, provided the student obtains satisfactory marks.

Examinations for the scholarships were given by College Entrance Examination Board, Princeton, New Jersey.

The students who received scholarships are as follows:

Lowell Textile Institute:

Peter M. Rowe
Paterson, New Jersey
Joel M. Heim
New York, New York
Joel H. Grill
Brooklyn, New York
Florence P. Liston
Lowell, Massachusetts
Daniel W. Dexter, Jr.
Wes: Chelmsford, Massachusetts
Joseph C. Morris
Long Beach, New York
Kirk Bussiere
Pittsfield, Massachusetts
Carl F. Pihl
Concord, New Hampshire
Charles H. Bethel
Great Neck, New York
Henry G. Braxton
Louisville 4, Kentucky
Michael B. Kaye
Watertown, New York
Warren E. Sheldrake
Towaco, New Jersey
Michael Hochfeld
Bronx, New York
Lazarus J. Travis
Brookline, Massachusetts
Parker W. Longbottom
Claremont, New Hampshire
Edward Giard
Peterborough, New Hampshire

Textile School of R. I. School of Design:

Loraine L. Tucker
Arlington, Massachusetts
Emanuel Goldstein
Brooklyn, New York
Leo Peloquin
Manville, R. I.
James E. Farrington
Wickford, Rhode Island

New Bedford Textile Institute:

Janet E. Fitzpatrick
Westbury, New York
William P. Colvin
North Lakeville, Massachusetts

Bradford Durfee Technical Institute:

Cornelius J. Murphy
Waldwick, New Jersey
Patricia A. Spang
Buffalo, New York

• "Ludox" Commercially Available

The Du Pont Company announces that "Ludox" colloidal silica—a new product used by the textile, rubber, wax, and other industries—is now being produced in full-scale commercial quantities.

A new unit to manufacture this product has just been completed at the East Chicago, Indiana, Works of the Graselli Chemicals Department. Deliveries of "Ludox" can now be made in any desired quantities.

When first announced by Du Pont in October, 1947, "Ludox" was available only on a small scale in 18 per cent silica concentrations. As a result of additional research and development work, stable solutions with a concentration of 30 per cent are now being produced. It is stated that, so far as is known, such a high concentration of stable silica in dispersion has never been available commercially. This higher concentration permits substantial reduction in shipping costs and simplifies storage problems. Du Pont chemists also believe that it will broaden the field of application for "Ludox."

"Ludox" already is being used in a variety of fields. It is said to be effective in weave-setting treatments for rayon fabrics and in other textile applications. In rayon it is said to increase friction between the fibers, thereby improving fabric "stability." It also is said to strengthen yarn. In addition, it is stated, it is finding applications in modifying many types of aqueous solutions and emulsions where it increases bond and film strength, and water resistance of adhesives, sizes or coatings. It also reduces objectionable stickiness or tackiness.

• General Releases

General Dyestuff Corp., 435 Hudson Street, New York 14, N. Y., announces release of circulars describing the following new products:

Fastusol Blue LRLA—a new homogeneous direct dyestuff which produces fairly bright reddish shades of blue on cotton, rayon and other cellulosic fibers. In a medium depth of shade the light fastness is said to be very good to excellent on cotton and excellent on rayon. The light fastness is said to be affected relatively little by urea-formaldehyde, although somewhat more by melamine-formaldyehdye crease proofing treatments. In other fastness properties it does not materially differ

from other fast to light direct blues. When applied to mixed material containing cotton or rayon and wool, the animal fiber is dyed considerably lighter than the vegetable fiber, but a uniform shade can be obtained with a small amount of fast to light neutral dyeing acid blue. Acetate rayon is left practically unstained.

It exhausts rapidly at the boil and does not level well once it has drawn into the fiber. Very little salt is required as otherwise the color strikes too rapidly. The product should be applied with a very small amount of salt in the starting bath and the temperature should be raised slowly. The affinity at temperatures below the boil is very good. It covers dead cotton well. It is in non-dusting form and soluble at the rate of 3 ozs. per gallon. *Circular G-517.*

Alizarine Blue SAP-CF—a level dyeing acid dyestuff which produces bright medium blue shades said to possess very good fastness to light and is very widely used for dyeing worsted piece goods, hats, carpets, carpet and knitting yarns, etc. In combination with Fast Light Yellows 3GX-CF and Fast Light Red BA-CF or other level dyeing and light fast acid colors, it is commonly used as the blue component for mode shades, taupes and darker shades. The product is sufficiently free from copper and manganese to be suitable for material to be rubberized. Acetate rayon effects are left unstained. The solubility is good.—*Circular G-518.*

Indanthrene Printing Violet RR Extra Paste—specially standardized for printing. It is a finely dispersed, non-settling, non-drying, grit-free paste. It fixes well on cotton and rayon. It produces a bright shade of violet and is said to have good to very good fastness to washing and very good fastness to chlorine and light.—*Circular G-526.*

Prevento! GDC Liquid—a ready to use alkaline water solution of the mildewproofing bactericidal and preserving agent, Preventol GD. It is intended for use in the prevention of mildew and rot in fabrics for outdoor exposure, such as awnings, tents, tarpaulins, covers, sewing threads, hatch covers, reaper aprons, military fabrics, etc. It may also be used in the preservation of liquid and paste products such as glues, pastes; adhesives, printing pastes and sizes, for slime control in paper mills, for preservation of paper pulps in wet storage and mildewproofing of wallboard. —*Circular GDC-293.*

• Meeting of Technical Committee 38

Steps to organize the international standardization work on textiles and textile test methods were taken at the meeting of Technical Committee 38 on Textiles of the International Organization for Standardization, held in Buxton, England, from June 7 through 12.

The committee meeting was attended by delegations totaling 95 from Australia, Belgium, Czechoslovakia, Finland, France, India, Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom, the U.S.A., and the USSR. Assignment of the secretariat for the committee to the United Kingdom was confirmed by agreement between the delegations from the United States and the United Kingdom.

The objective of the committee is to coordinate and unify national standards in the field of textiles in order thereby to decrease barriers to international trade in the field.

Building on the work accomplished in the prewar days by the International Standards Association, to which the International Organization for Standardization (ISO) is the postwar successor, the committee approved and transmitted to the General Secretary of the ISO for circulation as an ISO recommendation the standard established by the ISA for designating the twists of yarns as S Twist and Z Twist.

Because of the extent of the field to be covered, certain aspects have been assigned to subcommittees, of which the United States will hold the secretariats for the Subcommittee on Shrinkage and for the Subcommittee on Yarn Testing. Also because of the work currently under way as a joint project between the American Association of Textile Chemists and Colorists and the Society of Dyers and Colourists in England, the secretariat for the Subcommittee on Color Fastness with particular relation to light, washing, and perspiration, will be held jointly by the United States and the United Kingdom.

United States participation in this—as in all ISO work—will be through the American Standards Association which is the American member of the ISO.

The meeting of the committee was particularly noteworthy for the technical competence of the delegations and for the marked readiness on the part of all the delegations to see others' points of view and to arrive at a satisfactory basis for international technical cooperation, Vice Admiral G. F. Hussey, Jr., secretary of the American Standards Association, and member of the delegation representing the Association, reported.

The United States delegation, which was an especially strong representation from the technological fields in this country, included the following:

D. E. Douty, Chairman of the Board, United States Testing Company, Inc.;

Designated by the American Council of Commercial Laboratories, National Federation of Textiles, Inc., and the New York Board of Trade. Chairman of the delegation.

William D. Appel, Chief, Textiles Section, National Bureau of Standards;

Designated by the National Bureau of Standards.

Professor H. J. Ball, Head of Textile Engineering Department, Lowell Textile Institute;

Designated by the American Society for Testing Materials.

J. Robert Bonnar, Technical Director, General Dyestuff Corporation;

Designated by American Association of Textile Chemists and Colorists.

Dr. Frederic Bonnet, American Viscose Corporation;

Designated by the American Association of Textile Technologists, the New York Board of Trade, and the National Retail Dry Goods Association.

George S. Buck, National Cotton Council;

Designated by the Council.

Dr. Carl M. Conrad, Southern Regional Research Laboratory, U. S. Department of Agriculture;

Designated by the Bureau of Agricultural and Industrial Chemistry.

J. B. Goldberg, Director of Research, J. P. Stevens & Co., Inc.;

Designated by the American Association of Textile Technologists, Inc., National Federation of Textiles, Inc., New York Board of Trade, Inc., and the Textile Research Institute.

Vice Admiral George F. Hussey, Jr., USN (Ret), Secretary of the American Standards Association;

Designated by the American Standards Association.

Edward T. Pickard, Secretary, The Textile Foundation;

Designated by the Textile Foundation, The Textile Research Institute.

Dr. A. G. Scroggie, E. I. du Pont de Nemours & Co., Inc., Rayon Department;

Designated by American Society for Testing Materials.

D. L. Worf, Office of Naval Research, U.S. Navy;

Designated by the Office of Naval Research.

• Benzotrifluoride

The Hooker Electrochemical Company announces the pilot plant production of benzotrifluoride (trifluoromethylbenzene). This new compound is of potential interest as an intermediate in the preparation of dyestuffs and other chemicals. It is said to have excellent thermal stability and good dielectric properties.

Benzotrifluoride is a water white aromatic liquid which is completely miscible with most common solvents. The trifluoromethyl (CF_3) group is generally strongly meta directing. Its distillation range is 2° including 101°C; freezing range is

from —28.5° to —29.5°C; specific gravity at 15.5°C is 1.197.

Technical Data Sheet No. 350 describes the product in more detail. Samples and literature may be obtained by writing on your business letterhead to the Hooker Electrochemical Company, Niagara Falls, New York.

• Robinson Retires from Du Pont

Edmund G. Robinson, general manager of the Organic Chemicals Department, E. I. du Pont de Nemours and Company, since 1929, retired from active company service on July 1. He was succeeded by John F. Daley, general manager of the Du Pont Pigments Department. Mr. Robinson will continue as a member of the company's Board of Directors.

Both men are native Wilmingtonians with long service records in the Du Pont organization. Mr. Robinson, who is 62, joined the company as a chemist in 1905 shortly after his graduation from Swarthmore College. Mr. Daley came with the company in 1915 as a timekeeper at Carney's Point after attending local schools and the University of Virginia. He is 53.

Mr. Robinson has spent his entire business life with the Du Pont Company since beginning as an analytical and research chemist at the Eastern Laboratory at Gibbstown, New Jersey. His experience includes research and chemical control work in the manufacture of nitroglycerin and nitroglycerin substitutes, and in acid operations at the company's dynamite and smokeless powder plants. He served as director of the Delta Laboratory at the Arlington Plant, and as chemical superintendent at the Old Hickory Smokeless Powder Plant.

He was assistant director of the Experimental Station at Wilmington, and in 1919 was made assistant director of the Service Department. Two years later he became control manager of the newly-established and rapidly-developing Dyestuffs Department. In May, 1925, he became assistant general manager of this department and in August, 1929, was named general manager succeeding Willis F. Harrington, who had been made a member of the company's Executive Committee.

The department in the meantime has expanded greatly and has been renamed the Organic Chemicals Department. He has also been identified with the management of subsidiary and affiliated companies, notably the Bayer-Semesan Company and Kinetic Chemicals, Inc. He was elected a member of the Board of Directors of the Du Pont Company on March 8, 1937.

Mr. Daley was made director of sales of the Pigments Department in July, 1942, and served until October, when he was granted a leave of absence to serve as deputy field director of ammunition plants in the Office of the Chief of Ordnance.

• Joins Quaker

Joseph A. Korany has joined the Research and Development Laboratories of Quaker Chemical Products Corp. He will undertake market studies, including field testing, of new products as well as new applications of old products, as part of a broadening Quaker program into fields not now served.

• Officers, PTI Board of Governors

F. Everett Nutter, Goodall-Sanford, Inc., was reelected Chairman of the Board of Governors of the Philadelphia Textile Institute at their meeting on June 15th.

Rinaldo A. Lukens, Continental Mills, Inc., was reelected Vice-Chairman.

Other members of the Board of Governors include: Colonel Millard D. Brown, Continental Mills, Inc.; James Marshall Cole, Cold Spring Bleachery; David S. Cook, Highland City Mills; Clarence Ederer, Ederer, Inc.; Theodore B. Hayward, Swift & Company; M. Earl Heard, West Point Mfg. Co.; Gerome Leonard, Gerome Leonard Co.; Carl C. Mattmann, Textron, Inc.; Russell C. Osborne, Rider-Osborne-Devine, Inc.; Staunton B. Peck, School of Industrial Art; H. Wickliffe Rose, American Viscose Corp.; Edgar L. Schlesinger, United Merchants & Mfrs., Inc.; Frederick H. Schloss, Darlington Fabrics Corp.; Robert A. Smith, American Viscose Corp.; Paul Whitin, Jr., High Pine Weavers; Frank Zurn, Alco-Zander Co.

Bertrand W. Hayward, Director, and Richard S. Cox, Dean, made their annual reports to the Board of Governors on this occasion.

• Study on Research

How trade associations and other groups of manufacturers carry on their technical and scientific research in industry-wide problems is the subject of a study published by the Department of Commerce.

The Department had the assistance of 80 cooperating associations in gathering and preparing the material for publication, according to H. B. McCoy, Director of the Office of Domestic Commerce. Text is the work of Gustav E. Larson, of ODC's Trade Association Division.

The 64-page booklet, "Trade Association Industrial Research," describes how associations finance research; select technical committees and decide on projects; coordinate and supervise research programs; and disseminate findings in their industries. It should be of particular value to trade association executives who wish information on industrial research management practices, or are looking for suggestions for further research programs in their own industries, and in obtaining support for them.

Copies of "Trade Association Industrial Research" may be obtained through the field offices of the Department of Commerce, or from the Superintendent of Documents, Washington 25, D. C., at 25 cents each.

• Join Welch, Holme & Clark

James Howard and Eugene V. Depuis have joined the sales force of Welch, Holme, & Clark Co., New York dealers in oils, fats, and chemicals, according to a recent company announcement.

Mr. Howard is a graduate of the London Polytechnic Institute, a former R.A.F. chief pilot officer, and prior to his joining WH&C, a field sales engineer for Philco. He has been assigned to cover Jersey City, Hoboken, and Manhattan. Mr. Depuis, for several years associated with Adam Cook's Sons, Inc., will cover the Brooklyn, Bronx, and Queens territories for the company.

OBITUARY

GEORGE W. SUMMERSBY

GEORGE WALTER SUMMERSBY, President of the Bradford Dyeing Association since 1932, died on June 15th at his home, The Anchorage, in Watch Hill, Rhode Island, after a long illness. He was 57 years old.

Mr. Summersby was born in Westerly, Rhode Island, and was graduated from Lowell Textile Institute in 1911. He entered employment with the Atlantic Mills in Lawrence, Massachusetts, and during the first war served as a lieutenant at the Philadelphia Navy Yard. He was treasurer and general manager of the Boston Manufacturing Company, Waltham, Mass., from 1929 to 1931 and was appointed later as receiver for this firm. He also served in various capacities with the New Bedford Spinning Company and the Spencered Corporation of Spindale, North Carolina. He joined Bradford in October of 1932.

Mr. Summersby was a Mason and a member of the National Association of Finishers and Dyers, the National Association of Cotton Manufacturers, the Misquamicut Golf Club at Watch Hill and the Union League Club of New York.

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SELECTION OF VAT DYES FOR CONTINUOUS DYEING PROCESSES

The widespread installation of equipment for applying vat dyes to fabrics by methods based on pigment padding followed by reduction and fixation of the dye in a high temperature liquid bath, or in a steam atmosphere, has created a demand for more data on the properties of vat dyes. Unusually high temperatures are used in these newer methods because they contribute two main advantages:

1. The rate of reduction is tremendously increased, and highly dispersed vat dyes, typified by the Calcoloids**, reduce completely in a few seconds.

2. The rate of diffusion of the leuco vat dye into the fiber is tremendously increased. Excellent penetration and fixation result and the full fastness inherent in vat dye is obtained although the duration of dyeing is only a few seconds.

The intelligent selection of dyes for application by high temperature methods must be based on accurate information about the speed of reduction, leuco stability and affinity for the fiber of the individual vat dyes. Such information is given in Calco Technical Bulletin No. 793.

Considerable information is given also about the full prewar vat dye line of the I.G. as well as about the Calco line of vat dyes. A color plate, diagrams and tables supplement the text. A laboratory device for investigating the behavior of padded cloth during passage through a liquid reduction bath is described. This device is of help in determining how much dye must be added to the reduction bath prior to a commercial run in order to maintain a constant shade on the cloth from start to finish of a run.

POPULAR DYES FOR TOWELS

Most of the popular shades for towels can be matched with the following dyes:

*Calcosol** Copper Brown Double Powder—Dusty Rose
*Calcosol Blue BLD Double Powder—Blue
Calcosol Jade Green N Supra Double Powder—Green
Calcosol Fast Yellow Paste—Gold
*Calcoloid Yellow GCD Double Powder—Canary
*Calcoloid Golden Orange GD Double Powder—Peach
Calcosol Violet BN Extra Paste—Lavender

*Paste types available also. **Trademark

These types are all suitable for dyeing these towel shades either in raw stock or yarn form. They are all compatible and can be combined to produce a large range of desirable shades with the desirable fastness properties required for towels.

VAT DYE FASTNESS WITH GREATER EASE OF APPLICATION

Calco soluble vat dyes are suggested for roller printing, screen printing, cotton dyeing, rayon dyeing and wool dyeing. They print well in conjunction with naphthol and stabilized azoic printing colors.

These dyes give the corresponding vat dye fastness with greater ease of application. On wool they are recommended mainly for tops or raw-stock dyeing with resultant excellent all around fastness.

Since the formulations and procedures will vary with the type of material and equipment, we suggest your getting our recommendations for your specific problem.

BRILLIANCE AND CONSISTENCY IN SCARLETS AND PINKS

Printers require a full range of scarlets and pinks for fashionable shades in prints.

The following are recommended for full brilliant shades of scarlet and pink on rayon or cotton:

Calcosol Printing Scarlet 2GHN Paste
Calcosol Printing Scarlet 2B Paste
Calcosol Printing Scarlet 3B Paste
Calcosol Pink FFP Paste
Calcosol Pink FBP Paste

Maximum brilliance of shade and consistent performance are paramount properties of these printing pastes. They are widely used for the printing of dress goods, draperies and other fabrics.

FOR THE TEXTILE BOOKSHELF

Application of Microscopy to the Textile Industry (Calco Technical Bulletin No. 796)—Points out how the microscope, if operated by qualified personnel, can be a useful tool in the manufacture of a satisfactory product at the lowest possible cost.

Vat Dyeing of Wool (Calco Technical Bulletin No. 797)—Describes a new process for the application of the complete line of Indigoid and Anthraquinone Vat Dyes to certain types of wool materials.

"Hey Sis, Repulsive-but-Rich is here!"

COMMONWEALTH
COLOR & CHEMICAL CO.

More than forty years' experience in the manufacture of Chemical Specialties, Dyestuffs and Dyewoods for the Textile and Allied Trades . . .

MAIN OFFICE AND WORKS:
NEVINS, BUTLER and BALTIC STREETS, BROOKLYN 17, N. Y.
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The Fleet Line
OF FINISHING EQUIPMENT

TLBT PIECE DYE KETTLE

An Extremely VERSATILE Machine

Heavy Woolens at Putnam Woolen Corp

OTHER USES ARE:
Plushes in a New England mill—Men's Wear at Lymansville Co.—Heavy Knitted Fabrics at Draper Bros. Co.—Blankets at North Star Woolen—Women's Wear at Gonic Manufacturing Co.

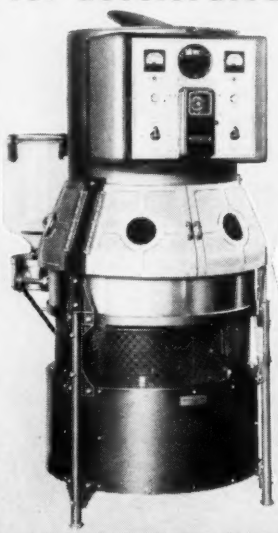
OTHER ADVANTAGES

- Tangles, tie-ups, wrinkles, creases and dye streaks virtually eliminated.
- Knurled drum reel absolutely eliminates slip, even on rayon gabardines.
- Dyestuff savings up to 10% compared with other stainless kettles, more with wooden types.

Circular on request

RIGGS AND LOMBARD
INCORPORATED
FOOT OF SUFFOLK ST., LOWELL, MASS.

FADE-OMETER
for accelerated color fading



• Originated and made solely by Atlas. Used all over the world and accepted as the standard color testing machine by the textile industry for over a quarter of a century.

Specimens are rotated around the Atlas Enclosed Violet Carbon Arc—the closest approach to natural sunlight. Temperature automatically controlled. No loss of light intensity of arc during life of machine.

ATLAS ELECTRIC DEVICES CO., 361 W. Superior Street, Chicago, Ill.

ATLAS-OMETERS
WEATHER-OMETER ★ LAUNDER-OMETER ★ FADE-OMETER

M

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July 12,

More uses for this "across-the-board" detergent . . . it's non-ionic!

HOUGHTON'S

CERFAK 1300

No surface active agent will do *all* cleansing and wetting jobs and do them equally well. But textile chemists know that a non-ionic detergent will have a wider range of applications than will anionic or cationic types.

And they're getting to know Cerfak 1300. This concentrated liquid detergent is a new member of Houghton's Cerfak family. It has not only good detergent ability in all kinds of water, but it is a fast wetting agent, too.

That's why we call Cerfak 1300 an "across-the-board" detergent. And that's why you'll want to get all the data on it. The first step is to write for the new fact-full folder.

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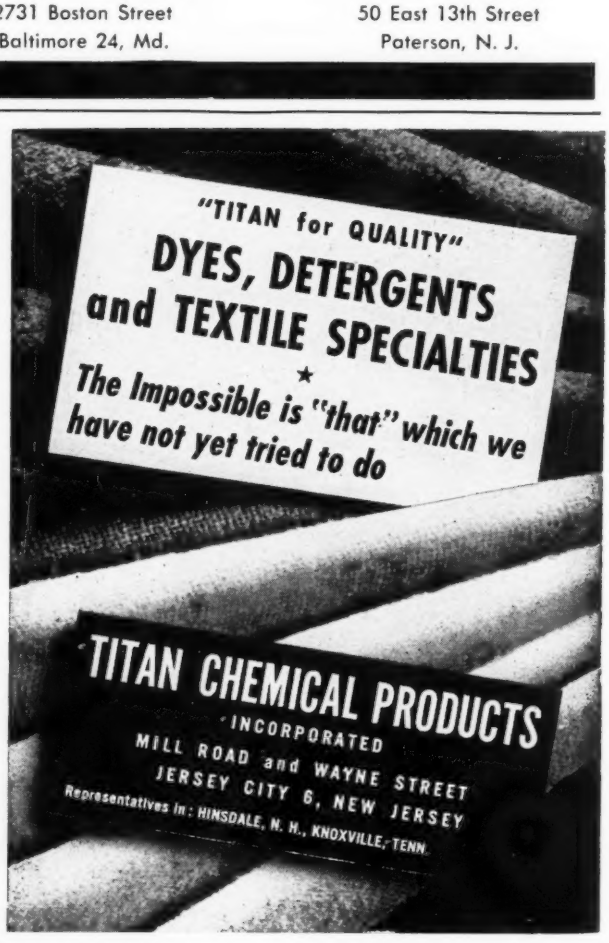
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DYES, DETERGENTS
and TEXTILE SPECIALTIES
★
The Impossible is "that" which we have not yet tried to do
TITAN CHEMICAL PRODUCTS
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Representatives in: HINSDALE, N. H., KNOXVILLE, TENN.

NOPCO PRESENTS

UNISIZE

AMAZING NEW 6-IN-1 SIZE
FOR ACETATE AND VISCOSE RAYON WARPS

1 Product 6 Functions

As a
1 Binder
2 Softener
3 Penetrant
4 Lubricant
5 Humectant
6 Defoamer

EASY TO USE—JUST MIX WITH WATER

"UNISIZE" is a *complete*, one-product size for Acetate and Viscose Rayon warps of all constructions . . . its unique, balanced properties provide advantages far surpassing those of conventional warp sizing compounds . . . its *simplicity*, *effectiveness* and *economy* have won unanimous and enthusiastic approval from users.

WHAT "UNISIZE" IS

"UNISIZE" is *chemically* a synthetic, proteinized, water-soluble polymer; *physically* a light tan free-flowing granulation—a single, *one-product* size which performs *six* essential sizing functions.

ADVANTAGES OF "UNISIZE"

SIMPLE, READY TO USE you waste no time predissolving raw materials . . . you need no complicated formulas. "UNISIZE"—a *model of simplicity*—affords the big advantage of a *single* product replacing the many complex mixes of the past. *Extremely soluble*, "UNISIZE" dissolves quickly and completely without gelling or lumping.

CLEAR-CUT FORMULATION you simply weigh the required amount of "UNISIZE" . . . 25 lbs. for Viscose warp, 50 lbs. for Acetate . . . and add it to 100 gallons of water heated to 180° F. Then, stir slowly for 8 minutes—run in quetch at 150° F.

EVEN DISTRIBUTION ON WARP in the quetch, there's no foaming, scumming or separation to prevent even distribution of the size on your warp. The warp comes off the last can without sandy hand—*smooth* and *firm*.

SUPERIOR BOND, FLEXIBLE FILM creating a *strong* bond, forming a *flexible*, *non-tacky* film, "UNISIZE" gives you *maximum* filament protection . . . eliminates taping . . . prevents sticking on drying cans.

ANTISTATIC PROPERTIES by preventing static during the *slashing* operation, "UNISIZE" eliminates banding. These same properties also reduce static during *weaving*.

UNIFORM SIZING "UNISIZE" will give you uniform sizing, warp after warp . . . the result of Nopco's rigid control through every step of its manufacture.

EASE OF BOIL-OFF "UNISIZE" scours out readily during normal boil-off procedure. No enzymes are required.

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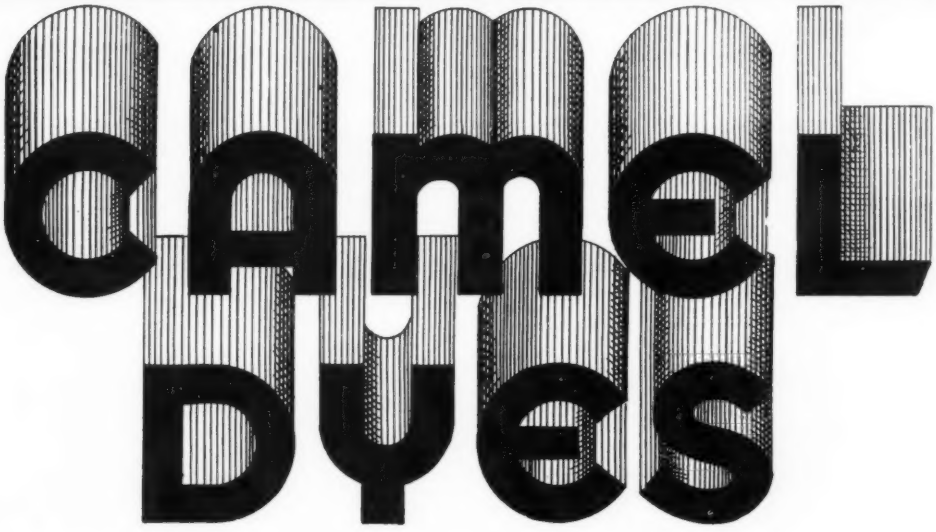

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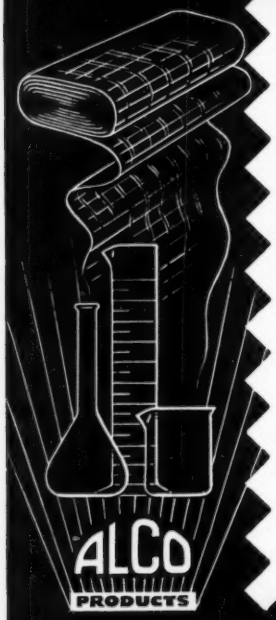

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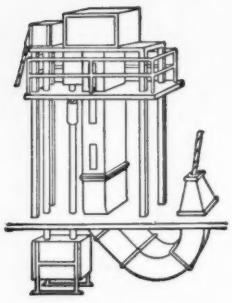

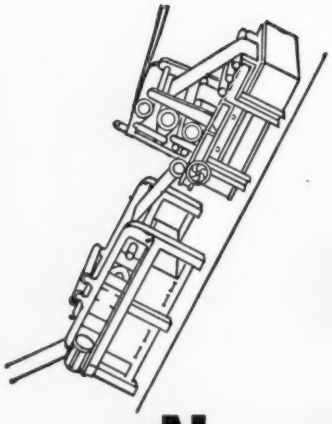

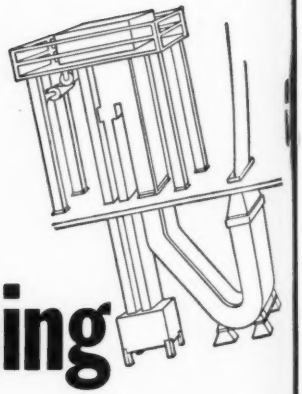

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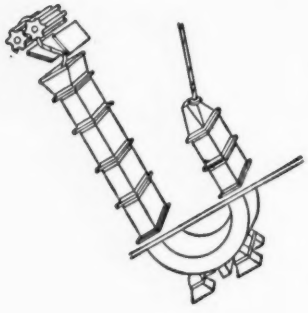

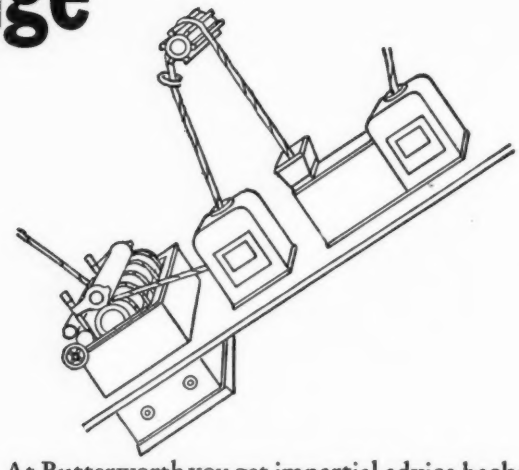

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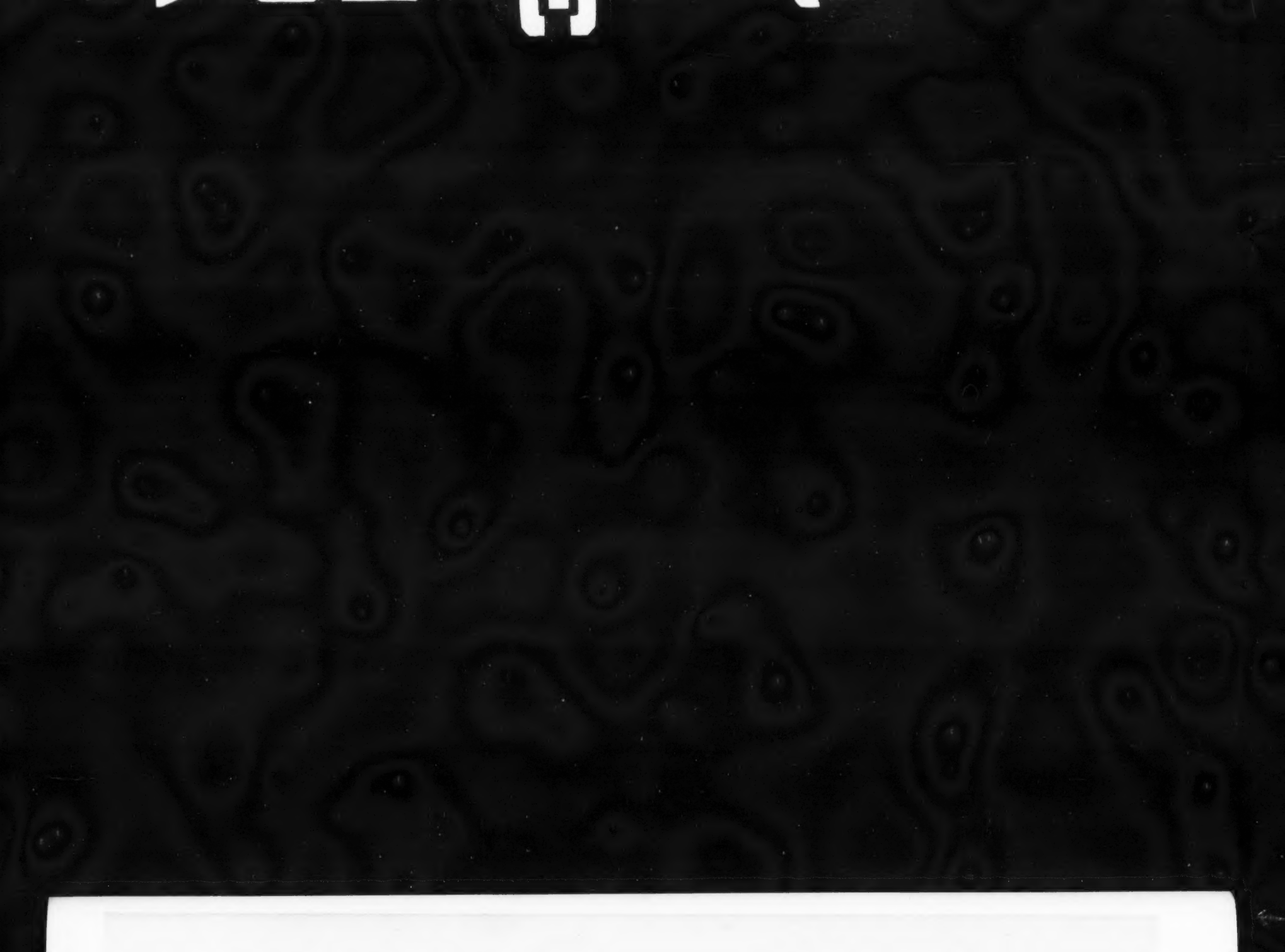
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